

**CITY OF LODI
INFORMAL INFORMATIONAL MEETING
"SHIRTSLEEVE" SESSION
CARNEGIE FORUM, 305 WEST PINE STREET
TUESDAY, JULY 30, 2002**

An Informal Informational Meeting ("Shirtsleeve" Session) of the Lodi City Council was held Tuesday, July 30, 2002 commencing at 7:03 a.m.

A. ROLL CALL

Present: Council Members – Hitchcock, Howard, Land, and Nakanishi

Absent: Council Members – Mayor Pennino

Also Present: City Manager Flynn, City Attorney Hays, and Deputy City Clerk Taylor

B. CITY COUNCIL CALENDAR UPDATE

Deputy City Clerk Taylor reviewed the weekly calendar (filed).

City Manager Flynn offered his condolences to Richard Prima for the recent loss of his brother. Mr. Prima thanked Mr. Flynn and extended his gratitude to the Public Works staff who stepped up to prepare and deliver this morning's presentation and conduct yesterday's public meeting.

C. TOPIC(S)

C-1 "Update on Phase II Stormwater Program Permit Requirements"

City Engineer Wally Sandelin and Management Analyst Marlinda Devera distributed copies of Technical Memorandum No. 3 (filed) prepared by Black & Veatch, and provided a summary of the National Pollutant Discharge Elimination System (NPDES) Phase II Implementation with the use of overheads (filed).

Management Analyst Devera stated the public meeting held yesterday included state and county representative presentations and that approximately 30 developers, contractors, and private citizens attended. She shared that many in attendance were already aware of the developer guidelines, but expressed concern with local enforcement and penalties.

City Engineer Sandelin reported that during the 1970s, publicly owned treatment and industrial facilities were the focus of the state; in 1987 the federal regulation works were amended; and in 1990 specific guidelines were established for communities with 100,000 or more population. In 1999, regulations were adopted for Municipal Separate Storm Sewer Systems (MS4) serving small communities, requiring cities to file a notice of intent with the Regional Quality Control Board. This in part is the Storm Water Management Plan (SWMP), which contains control measures to include public education and participation, illicit discharge detection, and elimination, construction site storm water runoff control, post-construction storm water management, and pollution prevention. Engineering consultants Black & Veatch prepared three technical memos addressing these main categories, which will be compiled into the SWMP. The plan will be brought to the City Council to review and approve actions, and after submittal of the plan to the State, future actions may include modifying project design and construction standards, and municipal code revisions to more precisely address storm water issues including gray water. The City will have to develop a program to reduce pollutants, develop penalties, and create a site plan for review, inspection, enforcement, and public input. Following Council action the Notice of Intention will be filed prior to the March 2003 due date.

In response to Mayor Pro Tempore Hitchcock, Mr. Sandelin explained that while City Council would be asked to consider modifications to the municipal code, staff was not prepared to address specifics until a thorough review of the NPDES Phase II draft requirements and the Black & Veatch Technical Memorandum No. 3 could be conducted.

Mr. Sandelin stated staff may address the frequency and conduct of fundraising car washes and construction activities causing substantial sediment in the street, both of which would create a regulatory problem in determining responsibility with the fundraising entity, property owner, or contractor. He also shared that the State is the regulating authority for the community, but after the City obtains its permit, it becomes the authority to inspect, enforce, and penalize, and the State may choose to take additional action. He stated the biggest change in enforcement is a reduction from the five-acre to the one-acre threshold, meaning that if one acre is disturbed, even though only 10% of that acre may be modified, it falls within the new regulations. Mr. Sandelin stated most developers in Lodi are far ahead of the curve in their understanding and response to state regulations, but the future will prove difficult when developers move out and owners, unaware of requirements and guidelines, become responsible for properties.

Mr. Sandelin noted the City is not interested in fines, but rather in requesting that developers add the SWMP to their development improvement plans, and being prepared to offer incentives for compliance. Implementation of the SWMP will include meetings, and brochures to communicate design criteria and construction standards. The objective is to establish best management practices having measurable goals and a timetable that achieves contaminant reduction to the maximum extent practical. Pollution prevention and source control is the better method for contamination reduction. Developers currently use tubes of straw instead of fabric fencing to control sediment discharge, having discovered the straw to be much more effective.

In response to Council Member Howard, Mr. Sandelin reported that Lodi does not currently utilize reclaimed water for park maintenance purposes, as is the case in many larger communities. He shared that if the City were to implement such a program, the reclaimed water, once it is discharged to the gutter carrying a modest amount of fertilizer and contaminants, would fall under the auspices of storm water regulations.

At the request of Council Member Land, Mr. Sandelin explained that developers will be required to take out their permit with the State, paying a fee of \$250 to \$500, triggering the City to implement the permit and inspection process, which will be detailed in staff's recommendations to Council in October. Mr. Land expressed his concern about concrete delivery vehicles washing out their tubs in the street and down the drain system, and dumping large quantities of leftover product on empty lots from landscape and swimming pool jobs. Mr. Sandelin noted that the State has similar concerns, and that another large problem in our community is painters cleaning their brushes and painting equipment onto the ground and into the gutter.

Council Member Land inquired about the status of the Delta Keeper Program and if Phase II would affect their filing of frivolous lawsuits for hazardous materials and waste. Public Works Director Prima stated that federal regulations for industrial activity and storm water permits are spelled out clearly, and California has adopted a general permit list for industrial activity requiring the filing of a Notice of Intent to be covered. Delta Keeper reviews this list, discovers sites that have not filed and are therefore non-compliant, and the process begins as permitted under the law. Similarly, the State requires a construction activity general permit so the developer pays a fee outside the city. Now the City will have to obtain a permit for its storm water system, and the State will take a back seat, encouraging cities to take the lead in enforcement, inspection, and fines. He noted that Phase I and II allow for citizen action, which can result in frivolous lawsuits and costly settlements, but believed the State plans to deal with this issue in the near future. City Attorney Hays added that Delta Keeper may have made an error in focusing on Claude Brown, who is opposing them and making progress in establishing that contamination may not be caused by the industrial activity, but more likely the use of chain link fence.

Responding to Council Member Land, Street Superintendent Bradley stated the new street sweeping equipment and modified schedule is very effective and residents have been cooperative. He stated a few cars have been tagged, but the need for notices to residents has not been necessary, nor has there been a need to consider "no parking" signs or street barricades to permit towing of vehicles.

At the request of Council Member Land, Mr. Prima reported that illegal connections would be addressed on a case by case basis as new projects arise, and that it was not the City's intent to go back at this point and impose difficult or unreasonable requirements on customers, such as existing gas stations. Mr. Prima also shared that car wash fundraisers would not be banned, but suggestions would be made for using mats to cover the catch basin, or piping water to a landscape area to minimize discharge.

Council Member Howard commented on the importance of information gathered by the Stormwater Detective Program and its continued benefits to the community. Mr. Prima stated the funding for the program has and will continue to be a part of the City budget with no funding increases, but several education and information programs generated by the Phase II implementation will be difficult to identify in the budget.

Mayor Pro Tempore Hitchcock stated she hoped the State would realize that Phase II will have a cost to cities for personnel and program costs, and that funding and support would be appropriate. Responding to Ms. Hitchcock, Mr. Prima stated that while sand and oil traps were a major concern in the past, there are less than 100 in existence, and that checking these would become the City's responsibility under the Phase II implementation.

Mr. Prima stated assessing the City plan would be done through a wide field of measures as outlined in the permit application, but while the State required programs and goals are set forth, it offers no specific implementation plan. The City will outline programs, timelines, and public workshops to meet application guidelines; however, identifying success and measurable goals will be difficult. A decrease in debris and contamination through the testing of river water might be a direct result of any one or a variety of implemented programs. Staff will avoid looking at analytical measurements and concentrate on overall improvements like decreased materials in street gutters and monitoring for a decrease in the total maximum daily load. No successful statistics for the Phase I program have been released, but the City has been able to review and mirror other community procedures and activities.

In response to Council Member Nakanishi, Mr. Prima stated there were many contaminants, including zinc, that would need to be addressed now, including air conditioner condensation, which until now was considered to be relatively clean. He explained that storm water basins now capture the first flush of water and overflows, with water discharged directly and only high flow winds up in the basins. Storm water should run overland across vegetation or a small basin in an attempt to reduce overload, but the City would not be modifying basin designs at least for the next 10 years. The goal is to adequately manage new processes and implement better practices, but not make retroactive repairs at this time.

At the request of Mayor Pro Tempore Hitchcock, Mr. Prima explained that the domestic system, during the low flow of summertime, gets high concentrations of materials, and that perhaps that should be diverted to White Slough in certain areas where possible. Staff wants to proceed slowly to inform the public, line up funding, and move at a rational, moderate pace. He shared that adding operational costs to implement Phase II may total \$100,000 to \$200,000, but capital costs would be implemented as projects proceed, and there are currently sufficient funds from wastewater rates.

Continued July 30, 2002

D. COMMENTS BY THE PUBLIC ON NON-AGENDA ITEMS

None.

E. ADJOURNMENT

No action was taken by the City Council. The meeting was adjourned at 8:15 a.m.

ATTEST:

Jacqueline L. Taylor
Deputy City Clerk



CITY OF LODI

COUNCIL COMMUNICATION

AGENDA TITLE: Update on Phase II Stormwater Program Permit Requirements
MEETING DATE: July 30, 2002 (Shirtsleeve Session)
PREPARED BY: Public Works Director

RECOMMENDED ACTION: None at this time.

BACKGROUND INFORMATION: On numerous occasions staff has informed the City Council that the City will fall under the requirements of the Federal Clean Water Act's Phase II permit requirements for storm drainage. Earlier this year, the Council approved hiring the engineering firm of Black & Veatch to assist the City in preparing its permit application.

At that time, the State had not indicated just how the permit process would be implemented. Larger cities – Phase I – were required to obtain individual permits. Other activities requiring permits – Industrial and Construction Activities – obtained permit coverage under the terms of a General Permit. A General Permit outlines various requirements and the business or builder files a "Notice of Intent" for coverage under the General Permit and in that agrees to abide by the applicable terms. Just recently the State issued a draft General Permit for Phase II cities which is attached for review. The City has the option of seeking coverage under this General Permit, attempting to obtain its own permit, or join/modify an existing permit by March 10, 2003.

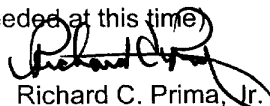
The first sections describe the history of the entire program and what entities are subject to the requirements. Lodi, already established as an urban area over 50,000 population, was listed in the Federal regulations as being covered. The "General Permit Conditions" and "Permit Requirements" on pages 5 through 10 describe minimum requirements. Many of the requirements involve public education and participation, which the City is already doing to some degree, although we will need to increase our efforts in these areas. We will also need to update our Municipal Code and Design/Construction Standards. Finally, we will need to upgrade our own municipal operation practices which will involve departments other than Public Works.

The actual permit starts on page 11. Specific "Storm Water Management Program Requirements" start on page 18. Probably the most significant requirement involves "Post-Construction Storm Water Management in New Development and Redevelopment" (starting on page 21 and described in more detail in Attachment 6).

Note that the Permit does not require that all these items be in place by the permit deadline. Typical language is "The Permittee must develop, implement and enforce a program..." during the 5-year permit term.

In addition to providing an overview of the draft permit, staff will report the results of our first public meeting on this subject which is scheduled for 3:00 pm, Monday, July 29 at Carnegie Forum.

FUNDING: Mainly Wastewater Fund (none needed at this time)


Richard C. Prima, Jr.
Public Works Director

Attachment

cc: Wally Sandelin, City Engineer
George Bradley, Street Superintendent
Fran Forkas, W/WW Superintendent

Marlinda Devera, Management Analyst
Roger Baltz, Parks & Recreation Director
Allan Vallow, Electric Utility Director

Mike Pretz, Fire Chief
Rad Bartlam, Community Development Director

APPROVED: _____

H. Dixon Flynn -- City Manager

7/12/02 8:55 AM

D
FACT SHEET
FOR
STATE WATER RESOURCES CONTROL BOARD (SWRCB)
WATER QUALITY ORDER 02-XX-DWQ
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT NO. _____

WASTE DISCHARGE REQUIREMENTS (WDRS)
FOR
STORM WATER DISCHARGES FROM
SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS (GENERAL PERMIT)
R

BACKGROUND

In 1972, the Federal Water Pollution Control Act (also referred to as the Clean Water Act [CWA]) was amended to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The 1987 amendments to the CWA added §402(p), which established a framework for regulating storm water discharges under the NPDES Program. Consequently, in 1990, the United States Environmental Protection Agency (U.S. EPA) promulgated regulations for permitting storm water discharges from industrial sites (including construction sites that disturb five acres or more) and from municipal separate storm sewer systems (MS4s) serving a population of 100,000 people or more. These regulations, known as the Phase I regulations, require operators of medium and large MS4s to obtain storm water permits. On December 8, 1999, U.S. EPA promulgated regulations, known as Phase II, requiring permits for storm water discharges from Small MS4s and from construction sites disturbing between 1 and 5 acres of land.

An "MS4" is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) designed or used for collecting or conveying storm water; (ii) which is not a combined sewer; and (iii) which is not part of a Publicly Owned Treatment Works (POTW) as defined at Title 40 of the Code of Federal Regulations (CFR) §122.2.

A "Small MS4" is defined as an MS4 that is not permitted under Phase I regulations. This definition of a Small MS4 applies to MS4s operated within cities and counties as well as governmental facilities that have a system of storm sewers.

Federal regulations allow two permitting options for storm water discharges (individual permits and general permits). The SWRCB elected to adopt a statewide general permit in order to efficiently regulate numerous storm water discharges under a single permit. In certain situations

a storm water discharge may be more appropriately and effectively regulated by an individual permit, a region-specific general permit, or by inclusion in an existing Phase I permit. In these situations, the Regional Water Quality Control Board (RWQCB) Executive Officer (EO) will direct the MS4 operator to submit the appropriate application, in lieu of a Notice of Intent to comply with the terms of this General Permit. In these situations, the individual or regional permits will govern, rather than this General Permit.

ENTITIES SUBJECT TO THIS PERMIT

This General Permit regulates discharges of storm water from “regulated Small MS4s.” A “regulated Small MS4” is defined as a Small MS4 that discharges to a water of the U.S. or other MS4 regulated by an NPDES permit and is designated in one of the following ways:

1. Automatically designated by U.S. EPA pursuant to 40 CFR §122.32(a)(1) because it is located within an urbanized area (defined by the Bureau of the Census) (see Attachment 1); or
2. Individually designated by the SWRCB or RWQCB after consideration of the following factors:
 - a. High population density – High population density means an area with greater than 1,000 residents per square mile. Also to be considered in this definition is a high density created by a non-residential population, such as tourists or commuters.
 - b. High growth or growth potential – If an area grew by more than 25% between 1990 and 2000, it is a high growth area. If an area anticipates a growth rate of more than 25% over a 10-year period ending prior to the end of the first permit term, it has high growth potential.
 - c. Significant contributor of pollutants to an interconnected permitted MS4 – A small MS4 is interconnected with a separate permitted MS4 if storm water that has entered the Small MS4 is allowed to flow directly into a permitted MS4. In general, if the Small MS4 discharges more than 10% of its storm water to the permitted MS4, or its discharge makes up more than 10% of the other permitted MS4s total storm water volume, it is a significant contributor of pollutants to the permitted MS4. In specific cases, the MS4s involved or third parties may show that the 10% threshold is inappropriate for the MS4 in question.
 - d. Discharge to sensitive water bodies – Sensitive water bodies are receiving waters, including groundwater, which are a priority to protect. They include the following:
 - those listed as providing or known to provide habitat for threatened or endangered species;

- those used for recreation that are subject to beach closings or health warnings; or
- those listed as impaired pursuant to CWA §303(d) due to constituents of concern in urban runoff (these include BOD, sediment, pathogens, petroleum hydrocarbons, heavy metals, floatables, PAHs, trash, and other constituents that are found in the MS4 discharge).

Additional criteria to qualify as a sensitive water body may exist and may be determined by the SWRCB or RWQCB on a case-by-case basis along with the MS4's designation justification.

- e. Significant contributor of pollutants to waters of the United States – Specific conditions presented by the MS4 may cause significant pollutant loading to waters of the U.S. that are otherwise unregulated or inadequately regulated. An example of such a condition may be the presence of a large transportation industry.

These factors are to be considered when evaluating whether a Small MS4 should be required to implement a storm water program that meets the provisions of this General Permit. An MS4 and the population that it serves need not meet all of the factors to be designated.

These factors were chosen to target MS4s that in general have the potential to impact water quality due to factors influencing discharges into their system or due to where they discharge. Some of the definitions provide “cut-off numbers.” Although there is no standard as to which numbers to use, dividing lines must be established in order to effectively use them as criteria.

Specifically, the high growth factor uses 25.7% growth over ten years. The average growth (based on county data from the Census) in California between 1990 and 2000 was 15.8%. The standard deviation was 9.9. Growth rates outside one standard deviation are more than 25.7%. The standard deviation is generally an indication of the spread of data. In defining the high growth factor, the standard deviation was used because it sets the limits within which most areas of California fall. County data was used because it was consistently available whereas 1990 populations for several of the cities and places were not readily available. Additionally, county data gives a broader picture of the growth dynamics in California. Because the data is not normally distributed, 68% of the data points do not necessarily fall within one standard deviation of the mean, however, it does provide a number in which to compare city and place growth rates to the average growth rate of California.

The significant contributor of pollutants to an interconnected permitted MS4 definition uses a value of 10%. This is meant to capture flows that may affect water quality or the permit compliance status of another MS4, but exclude incidental flows between communities.

Attachment 2 lists the cities and counties designated by the SWRCB and RWQCB as regulated Small MS4s at the time of permit adoption.

Certain governmental facilities, specifically state and federal sites, are served by Small MS4s. Cities, counties, and special districts often lack legal authority to regulate federal and state facilities, requiring that these facilities be permitted separately. Federal and state facilities within regulated Small MS4s, or within medium and large MS4s are also regulated Small MS4s if they fall into one of the following categories:

Category 1	<ul style="list-style-type: none"> • Serves (employee or guest) a daily and/or resident population of ten persons or more, • The facility is the site of outdoor municipal activity,¹ and • The facility is comprised of multiple structures (3 or more), including offices, storage areas, workshops, parking garages, etc.
Category 2	<ul style="list-style-type: none"> • The facility has a significant potential to cause or contribute to degradation of water quality.

The categories of state and federal MS4s were designed to capture “systems” of conveyances that also have impacts on water bodies, or have an employee or user populations that otherwise may not be targeted for storm water education, especially in the given settings. For example, universities and prisons often have populations that are segmented from the rest of a city yet are the site of municipal activities. Threshold populations are specified to include facilities that actually perform municipal or other activities and are able to maintain an adequate program. It is unlikely that smaller facilities would do so.

Attachment 3 lists the governmental facilities designated as regulated Small MS4s at the time of permit adoption.

NOTIFICATION REQUIREMENTS

As required by 40 CFR §122.33(c)(1) and the Porter-Cologne Water Quality Control Act (Porter-Cologne) §13376, regulated Small MS4s automatically designated by being within an urbanized area must submit to the appropriate RWQCB by March 10, 2003, a Notice of Intent (NOI) (Attachment 4) to comply with the terms of this General Permit, a Storm Water Management Program (SWMP) and a fee.

¹ For purposes of this definition, outdoor municipal activities are those activities conducted outside that are necessary to maintain infrastructure, including upkeep of grounds.

As required by 40 CFR §122.33(c)(2) and Porter-Cologne §13376 regulated Small MS4s designated by the SWCRB or RWQCB must submit to the appropriate RWQCB within 180 days of designation notification or March 10, 2003, whichever is later, an NOI (Attachment 4) to comply with the terms of this General Permit, a SWMP, and a fee.

Regulated Small MS4s relying entirely on Separate Implementing Entities to implement their entire storm water programs are not required to submit a SWMP.

Regulated Small MS4s that fail to obtain coverage under this General Permit will be in violation of the CWA and the Porter-Cologne Water Quality Control Act.

A regulated Small MS4 is considered to be permitted once the NOI has been received by the RWQCB. The MS4 shall then begin implementing its SWMP, however, the RWQCB EO may require refinement upon review of the SWMP if it appears to be an inadequate tool to achieve compliance with this General Permit.

Attachment 5 lists RWQCB contact information for questions and submittals.

GENERAL PERMIT CONDITIONS

Prohibitions

This General Permit prohibits the discharge of materials other than storm water that are not "authorized non-storm water discharges" (see General Permit §E.2.c) or authorized by a separate NPDES permit. This General Permit also incorporates discharge prohibitions contained in statewide and regional water quality control plans (basin plans).

Discharges or discharge-related activities that are likely to jeopardize the continued existence of any species that are listed as endangered or threatened under the Endangered Species Act or result in the adverse modification or destruction of habitat that is designated as critical under the Endangered Species Act are prohibited.

Effluent Limitations

Permittees must implement Best Management Practices (BMPs) that reduce pollutants in storm water runoff to the technology-based standard of Maximum Extent Practicable (MEP). In accordance with 40 CFR §122.44(k)(2), the inclusion of BMPs in lieu of numeric effluent limitations is appropriate in storm water permits.

Discharges shall not contain reportable quantities of hazardous substance as established at 40 CFR §117.3 or 40 CFR §302.4.

Receiving Water Limitations

Permittees must implement programs that protect water quality. If the Permittee's discharge is causing or contributing to exceedances of water quality standards, the Permittee must propose and implement improved BMPs to prevent such exceedances.

PERMIT REQUIREMENTS

This General Permit requires regulated Small MS4s to:

1. Develop and implement a SWMP that describes BMPs, measurable goals, and timetables for implementation in the following six program areas (Minimum Control Measures):

Public Education

The Permittee must educate the public in its permitted jurisdiction about the importance of the storm water program and the public's role in the program.

Public Participation

The Permittee must involve the public in the continual development and refinement of the SWMP, allow for input on the Minimum Control Measures, and encourage public participation in implementing the Minimum Control Measures. The Permittee must make copies of the General Permit and SWMP available to the public for review.

Illicit Discharge Detection and Elimination

The Permittee must adopt and enforce ordinances or take equivalent measures that prohibit illicit discharges. The Permittee must also implement a program to detect illicit discharges, such as discharge screening and facility inspections.

Construction Site Storm Water Runoff Control

The Permittee must develop a program to control the discharge of pollutants from construction sites greater than or equal to one acre in size within its permitted jurisdiction. The program must include inspections of construction sites and enforcement actions against violators.

Post Construction Storm Water Management

The Permittee must require long term BMPs that protect water quality and control runoff flow, to be incorporated into development and significant redevelopment projects, such as those detailed in Attachment 6.

Pollution Prevention/Good Housekeeping for Municipal Operations

The Permittee must examine its own activities and develop a program to prevent the discharge of pollutants from these activities. At a minimum, the program should

educate staff on pollution prevention, minimize pollutant sources, and utilize structural BMPs to keep pollutants out of storm water runoff.

2. Reduce its discharge of pollutants to the MEP.
3. Perform inspections and monitoring.

Storm Water Management Program (SWMP)

The SWMP must describe how pollutants in storm water runoff will be controlled and explain the BMPs that address the six Minimum Control Measures that will do this. Each BMP must have accompanying measurable goals to be achieved during the permit term as a means of determining program compliance and accomplishments, and as an indicator of potential program effectiveness. The measurable goals should be definable tasks such as number of outreach presentations to make, number of radio spots to purchase, or percentage of pollutant loading to reduce (other examples of measurable goals can be found on U.S. EPA's web-site at <http://www.epa.gov/npdes/stormwater/measurablegoals/index.htm>). This approach provides the flexibility to target an MS4's problem areas while working within the existing organization.

The Minimum Control Measures emphasize working with the public to prevent pollution during everyday activities as well as gaining support for funding the program. The MS4 has the flexibility to target specific segments of their residential or employee population in ways that are most appropriate for that particular segment. Taken together, the suite of public education approaches an MS4 takes should create a robust multimedia campaign that has a single message, which is threaded throughout the community through implementation of BMPs in the six program areas. This is exemplified by emphasis on post-construction measures. Post-construction controls target the problems associated with increasing the impervious area that usually accompanies development. By considering water quality during the design phase of a project, source control BMPs and treatment BMPs can more efficiently be incorporated into projects to combat the problems of polluted runoff. Along with construction site controls, storm water is considered and its pollutant impacts reduced during design, construction, and long-term use of the project.

For links to information on how to implement each of the Minimum Control Measures, including sample ordinances that address the respective Minimum Control Measures, please see SWRCB's internet site at <http://www.swrcb.ca.gov/stormwtr/municipal.html>. Additionally, U.S. EPA's internet site at http://cfpub1.epa.gov/npdes/stormwater/swphase2.cfm?program_id=6 provides examples of BMPs and associated measurable goals.

Maximum Extent Practicable (MEP)

MEP is the technology-based standard established by Congress in CWA §402(p)(3)(B)(iii) that municipal dischargers of storm water must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve. MEP is generally a result of emphasizing pollution prevention and source control BMPs as the first lines of defense in combination with

treatment methods where appropriate serving as additional lines of defense. The MEP approach is an ever evolving, flexible and advancing concept, which considers technical and economic feasibility. As knowledge about controlling urban runoff continues to evolve, so does that which constitutes MEP. The individual and collective activities elucidated in the MS4's SWMP becomes its proposal for reducing or eliminating pollutants in storm water to the MEP. The way in which MEP is met may vary between communities.

Generally, in order to meet MEP, communities that present greater water quality impacts must put forth a greater level of effort. Alternatively, for similar water quality conditions, communities should put forth an equivalent level of effort. However, because larger communities have greater resources (both financial resources as well as existing related programs that can help in implementing storm water quality programs), it may appear that they have more robust storm water programs.

For example, specific post-construction design standards (similar to the Design Standards outlined in Attachment 6) were determined to be MEP for large and medium MS4s (see SWRCB Order WQ 2000-11). Consequently, a regulated Small MS4 that is very similar to a large or medium MS4 would need to establish post-construction requirements such as the Design Standards in Attachment 6. Additionally, communities with an abundance of construction (high growth), would be most efficiently served by establishing post-construction requirements such as the Design Standards in Attachment 6. On the other hand, establishing such prescriptive requirements in relatively stable, smaller communities may not result in water quality benefits proportional to the effort, especially in the program's early development.

Inspections and Monitoring

Inspections and monitoring on multiple levels is important to a storm water program. Visual inspections and monitoring of storm water runoff and infrastructure (such as drop inlets, basins, and gutters) can say a lot about the effectiveness and needs of a storm water program. Through visual inspections and monitoring non-storm water discharges can be discovered and subsequently stopped, maintenance needs can be identified, and visual pollutants and erosion problems can be detected. Inspections of facilities are also important for public education and outreach, to ensure proper BMP implementation and maintenance at businesses and at municipal sites, and to detect non-storm water discharges. Additionally, chemical monitoring can be used to involve the public through citizen monitoring groups, detect pollutants, identify and target pollutants of concern, illustrate water quality improvements and permit compliance, and participate in total maximum daily load development and implementation.

Termination of Coverage

A Permittee may terminate coverage if a new operator has assumed responsibility for the regulated Small MS4, or the Permittee has ceased operation of its MS4. To terminate coverage, the Permittee must submit to the RWQCB a written request for permit termination.

Reliance on a Separate Implementing Entity (SIE)

A Permittee can rely on a separate entity to implement one or more of the six Minimum Control Measures, if the separate entity can appropriately and adequately address the storm water issues of the Permittee. To do this, both entities must agree to the arrangement and the Permittee must comply with the applicable parts of the SIE's program. The arrangement is subject to the approval of the RWQCB EO.

The Permittee remains responsible for compliance with these permit obligations if the SIE fails to implement the control measure (or component thereof). Therefore, the entities are encouraged to enter into a legally binding agreement to minimize any uncertainty about compliance with the permit.

If the Permittee relies on an SIE to implement all six Minimum Control Measures and the SIE also has a storm water permit, the Permittee relying on the SIE must still submit an NOI, fee, and certification of the arrangement. However, the Permittee is not required to submit a SWMP or annual reports, unless otherwise requested by the RWQCB EO. The arrangement is subject to the approval of the EO of the appropriate RWQCB.

For example, Sutter's Fort in downtown Sacramento (Sacramento is permitted as a large MS4) has more than three structures, maintains the infrastructure on the one-city-block park, and averages more than 10 visitors and employees per day when open. This would be a regulated Small MS4. Under an SIE arrangement, the Park would meet with the city of Sacramento's storm water manager to discuss the City's SWMP, such as illicit discharges, public education, and good housekeeping. By completing and submitting the SIE form along with the NOI, the Park is agreeing to follow Sacramento's storm water ordinances and participate in the applicable areas. The Park would not prepare a SWMP or annual reports but it must make its employees aware of the arrangement. If the Park violate provisions of Sacramento's program, by making illicit discharges for example, the Park would be in violation of its permit and subject to the penalties provided in the CWA.

Discharges from Offsite Facilities

Some regulated Small MS4s have offsite facilities that discharge storm water. An offsite facility is a geographically non-adjacent or discontinuous site that is a result of, or secondary to the primary facility. Storm water discharges from an offsite facility must be permitted if it meets the definition of a regulated Small MS4 itself. If the SWMP of the primary facility addresses the offsite facility, the permitted area of the primary facility may include this offsite area.

A facility is not considered offsite if it operates independently of another facility. In this case, two separate NOIs must be submitted, if they both meet the definition of a regulated Small MS4. For example, a public university may have an offsite lab that would not be in operation if the university were closed. However, Sutter's Fort would not be an offsite facility of the Folsom State Recreation Area, though they are both owned by the California Department of Parks and Recreation, because operation of one does not affect the operation of the other.

Monitoring and Reporting Requirements

The Permittee must monitor and track its program to ensure BMP effectiveness and must conform to other monitoring requirements that may be imposed by the RWQCB.

The Permittee is required to submit annual reports to the appropriate RWQCB by August 15th of each year (first to be submitted in 2004), or as otherwise required by the RWQCB EO. Annual reports must demonstrate that the permittee is controlling the discharge of pollutants in storm water to the MEP by summarizing the activities performed throughout the reporting period (July 1 through June 31). The report shall include the status of the proposed measurable goals, an evaluation of the program's effectiveness and any variances or changes to the SWMP necessary to improve performance.

Governmental Facilities

Governmental regulated Small MS4s possess a number of characteristics that set them apart from their municipal counterparts. These unique characteristics might lead governmental MS4 operators to question either the need to implement the entire suite of minimum control measures or their ability to comply fully with their Phase II storm water permit. In meeting the six Minimum Control Measures, a facility's employee population may serve as "the public" to target for outreach and involvement, and the facility may use policies in lieu of ordinances. Additionally, if the facility is "built out," the operator may certify that at the current time, no construction or redevelopment disturbing more than one acre is anticipated but if construction status changes, a program will be developed. If such a statement is made and construction occurs without adequate storm water considerations during design and construction, including consultation with the appropriate RWQCB, the operator will be in violation of this General Permit. Responsibility for developing a storm water program that comprises the minimum measures lies with the operator of the Federal or State MS4.

Retention of Records

The Permittee is required to retain records of all monitoring information and copies of all reports required by this General Permit for a period of at least five years from the date generated. This period may be extended by request of the SWRCB or RWQCB.

Role of the RWQCBs

The RWQCBs and their staff will oversee this General Permit by reviewing and requiring modification to SWMPs and other submissions, imposing region-specific monitoring requirements, reviewing reports, conducting inspections, and taking enforcement actions against permit violators. They may also issue individual permits to regulated Small MS4s, and general permits to categories of regulated Small MS4s. Upon issuance of such permits by an RWQCB, this General Permit shall no longer regulate the affected Small MS4s.

**STATE WATER RESOURCES CONTROL BOARD (SWRCB)
WATER QUALITY ORDER NO. 02 - XX - DWQ
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT NO. CAS00000X**

**WASTE DISCHARGE REQUIREMENTS (WDRs)
FOR
STORM WATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM
SEWER SYSTEMS (MS4s) (GENERAL PERMIT)**

The SWRCB finds that:

1. Urban runoff is a leading cause of pollution throughout California.
2. Pollutants of concern found in urban runoff include sediments, non-sediment solids, nutrients, pathogens, oxygen-demanding substances, petroleum hydrocarbons, heavy metals, floatables, polycyclic aromatic hydrocarbons (PAHs), trash, and pesticides and herbicides.
3. During urban development two important changes occur. First, where no urban development has previously occurred, natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots. Natural vegetated soil can both absorb rainwater and remove pollutants providing a very effective purification process. Because pavement and concrete can neither absorb water nor remove pollutants, the natural purification characteristics of the land are lost. Second, urban development creates new pollution sources as human population density increases and brings with it proportionately higher levels of vehicle emissions, vehicle maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc., which can be washed into the MS4. As a result of these two changes, the runoff leaving a newly developed urban area may be significantly greater in volume, velocity, and/or pollutant load than pre-development runoff from the same area.
4. A higher percentage of impervious area correlates to a greater pollutant loading, resulting in turbid water, nutrient enrichment, bacterial contamination, organic matter loads, toxic compounds, temperature increases, and increases of trash or debris.
5. Pollutants present in storm water can have damaging effects on both human health and aquatic ecosystems. In addition, the increased flows and volumes of storm water discharged from new impervious surfaces resulting from new development and redevelopment can significantly impact beneficial uses of aquatic ecosystems due to physical modifications of water courses, such as bank erosion and widening of channels.

6. When water quality impacts are considered during the planning stages of a project, new development and many redevelopment projects can more efficiently incorporate measures to protect water quality.
7. On December 8, 1999, EPA promulgated regulations under authority of the Clean Water Act (CWA) §402(p)(6). These regulations require the SWRCB to issue NPDES storm water permits to operators of small municipal separate storm sewer systems (Small MS4s).
8. The purpose of regulating a municipality's storm water discharge is to make that municipality accountable for what it is discharging through its storm sewer system if that discharge is likely to impact receiving water or another permitted municipality.
9. Of these Small MS4s, only "regulated Small MS4s" must obtain a permit. 40 CFR §122.32(a) defines regulated Small MS4s as those Small MS4s located within an urbanized area as determined by the latest Decennial Census by the Bureau of the Census (Attachment 1) or those that are designated by the permitting authority in accordance with designation criteria.
10. 40 CFR §123.35(b) requires the SWRCB to develop a process, as well as criteria, to designate Small MS4s as regulated Small MS4s.
11. In developing the designation criteria, factors were chosen to include parameters that may affect water quality. The following criteria will be considered in designating municipalities as regulated small MS4s.
 - a. High population density – High population density means an area with greater than 1,000 residents per square mile. Also to be considered in this definition is a high density created by a non-residential population, such as tourists or commuters.
 - b. High growth or growth potential – If an area grew by more than 25.7% between 1990 and 2000, it is a high growth area. If an area anticipates a growth rate of more than 25.7% over a 10-year period ending prior to the end of the first permit term, it has high growth potential.
 - c. Significant contributor of pollutants to an interconnected permitted MS4 – A Small MS4 is interconnected with a separately permitted MS4 if storm water that has entered the Small MS4 is allowed to flow directly into a permitted MS4. In general, if the Small MS4 discharges more than 10% of its storm water to the permitted MS4, or its discharge makes up more than 10% of the other permitted MS4's total storm water volume, it is a significant contributor of pollutants to the permitted MS4. In specific cases, the MS4s involved or third parties may show that the 10% threshold is inappropriate for the MS4 in question.

d. Discharge to sensitive water bodies – Sensitive water bodies are receiving waters, including groundwater, which are a priority to protect. They include the following:

- those listed as providing or known to provide habitat for threatened or endangered species;
- those used for recreation that are subject to beach closings or health warnings; or
- those listed as impaired pursuant to Clean Water Act Section 303(d) due to constituents of concern in urban runoff (these include BOD, sediment, pathogens, oil and grease, and other constituents that are found in the MS4 discharge).

Additional criteria to qualify as a sensitive water body may exist and may be determined by the SWRCB or RWQCB on a case-by-case basis along with the MS4's designation justification.

e. Significant contributor of pollutants to waters of the United States – Specific conditions presented by the MS4 may cause significant pollutant loading to waters of the U.S. that are otherwise unregulated or inadequately regulated. An example of such a condition may be the presence of a large transportation industry.

Attachment 2 lists the municipalities designated as regulated Small MS4s by the state at the time of permit adoption.

12. Governmental facilities with multiple structures often operate storm sewers that discharge the same types of pollutants that are associated with urban runoff discharged through city and county MS4s. The SWRCB has defined governmental facilities that meet one of the following categories as operating a Small MS4:

- a. The facility serves a resident or daily population of ten persons or more, the facility is the site of outdoor municipal activity², and the facility is comprised of multiple structures (3 or more) including offices, storage areas, workshops, parking garages, etc; or
- b. The facility has a significant potential to cause or contribute to degradation of water quality.

² For purposes of this definition, outdoor municipal activities are those activities conducted outside that are necessary to maintain infrastructure, including upkeep of grounds.

13. Governmental Small MS4s that are located within or discharge to an urbanized area or other Small, medium or large permitted MS4s are considered regulated Small MS4s. Attachment 3 lists state and federal regulated Small MS4s.
14. This General Permit requires regulated Small MS4s (Permittees) to develop and implement a Storm Water Management Program (SWMP) designed to reduce the discharge of pollutants to the Maximum Extent Practicable (MEP) and to protect water quality.
15. The MEP standard is an ever evolving, flexible and advancing concept, which considers technical and economic feasibility. As knowledge about controlling urban runoff continues to evolve, so does that which constitutes MEP. Permittees can satisfy the requirements through effective implementation of a SWMP, which must contain Best Management Practices (BMPs) that address six minimum control measures (MCMs). The Permittees' SWMPs must incorporate measurable goals, or Performance Standards, and time schedule of implementation.
16. Controlling storm water pollution to MEP in order to protect beneficial uses requires continuous review and improvement, which includes seeking new opportunities. To do this, the Permittee must, on a continuous basis, conduct and document evaluation of each relevant element of its program and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.
17. The purpose of the annual performance review is to evaluate the Permittee's SWMP effectiveness, the implementation of the SWMP and its Measurable Goals, and continuous improvement opportunities.
18. To obtain authorization for storm water discharges to surface waters pursuant to this General Permit, the regulated Small MS4 must submit to the appropriate California Regional Water Quality Control Board (RWQCB), a Notice of Intent to comply with the terms of this General Permit (NOI), fee (in accordance with the instructions attached to the NOI), and SWMP. Regulated Small MS4s relying entirely on Separate Implementing Entities to implement their entire programs are not required to submit a SWMP. Attachment 5 gives contact information for each RWQCB.
19. Each Permittee is individually responsible for adoption and enforcement of ordinances and policies, implementation of assigned control measures, BMPs, the right of entry/inspection needed to prevent or reduce pollutants in storm water, and for providing funds for the capital, operation and maintenance, and enforcement expenditures necessary to implement and enforce such control measures/BMPs within its jurisdiction. Enforcement actions concerning this General Permit will be pursued only against the individual Permittee responsible for specific violations of this General Permit.
20. In accordance with 40 CFR §122.28(p)(3), a RWQCB may issue an individual MS4 NPDES Permit to a regulated Small MS4 otherwise subject to this General Permit, or

adopt an alternative general permit that covers storm water discharges regulated by this General Permit. The applicability of this General Permit is automatically terminated on the effective date of the individual permit or the date of approval for coverage under the alternative general permit.

21. Certain BMPs implemented or required by Permittees for urban runoff management may create a habitat for vectors (e.g., mosquitoes and rodents) if not properly designed or maintained. Close collaboration and cooperative effort between the Permittees, local vector control agencies, RWQCB staff, and the State Department of Health Services is necessary to identify and implement appropriate vector control measures that minimize potential nuisances and public health impacts resulting from vector breeding.
22. This NPDES Permit is consistent with the anti-degradation policies of 40 CFR §131.12, SWRCB Resolution 68-16, and the RWQCBs' individual Basin Plans. Implementing storm water quality programs that address the six Minimum Control Measures in previously unregulated areas will decrease the pollutant loading to the receiving waters and improve water quality.
23. Following public notice in accordance with State and federal laws and regulations, the SWRCB, in a public meeting on _____ heard and considered all comments. The SWRCB has prepared written responses to all significant comments.
24. This action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21100, et seq.) in accordance with section 13389 of the Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code).
25. This NPDES permit is in compliance with Section 402 of the CWA and shall take effect 100 days after adoption by the SWRCB. Once in effect, the RWQCBs shall enforce the provisions herein.

IT IS HEREBY ORDERED that operators of Small MS4s subject to this General Permit shall comply with the following:

A. APPLICATION REQUIREMENTS

1. Deadlines for Notification

- a. By March 10, 2003, all regulated Small MS4s automatically designated (see Attachments 1 and 3), must either apply for coverage under this General Permit, submit an application for an individual or alternative general Small MS4 permit, or submit a joint application for modification of an existing large or medium MS4 permit (40 CFR §122.33(c)(1)).

- b. Within 180 days of notice, or March 10, 2003, whichever is later, a Small MS4 designated according to Finding 10 above (see Attachments 2 and 3), must either apply for coverage under this General Permit, submit an application for an individual or alternative general Small MS4 permit, or submit a joint application for modification of an existing large or medium MS4 permit (40 CFR §122.33(c)(2)).

2. General Permit Application

To obtain coverage under this General Permit, submit to the appropriate RWQCB a completed Notice of Intent (NOI) (Attachment 4), a SWMP, and appropriate fee. The SWMP shall meet all the requirements of Section E of this General Permit. Regulated Small MS4s relying entirely on Separate Implementing Entities that are permitted under the NPDES program to implement all six Minimum Control Measures are not required to submit a SWMP.

B. DISCHARGE PROHIBITIONS

1. Discharges of waste that are prohibited by Statewide or applicable Regional Water Quality Control Plans (Basin Plans) are prohibited.
2. Discharges from the MS4s regulated under this permit that cause or threaten to cause pollution, contamination, or nuisance are prohibited.
3. Discharges of material other than storm water to waters of the United States or another permitted MS4 are prohibited, except as allowed under Provision E.2.c, or as otherwise authorized by a separate NPDES permit.
4. Discharges or discharge-related activities that are likely to jeopardize the continued existence of any species that are listed as endangered or threatened under the Endangered Species Act or result in the adverse modification or destruction of habitat that is designated as critical under the Endangered Species Act are prohibited.

C. EFFLUENT LIMITATIONS

1. Permittees must implement BMPs that reduce pollutants in storm water to the technology-based standard of MEP. In accordance with 40 CFR §122.44(k)(2), the inclusion of BMPs in lieu of numeric effluent limitations is appropriate in storm water permits.

2. Storm water discharges regulated by this General Permit shall not contain a hazardous substance in amounts equal to or in excess of a reportable quantity listed in 40 CFR Part 117 or 40 CFR Part 302.

D. RECEIVING WATER LIMITATIONS

1. Discharges shall not cause or contribute to an exceedance of water quality standards contained in a Statewide water quality control plan or applicable Basin Plan.
2. The Permittee shall comply with Discharge Prohibition B.2 and Receiving Water Limitation D.1 through timely implementation of control measures and other actions to reduce pollutants in the discharges in accordance with the SWMP and other requirements of this permit including any modifications. The SWMP shall be designed to achieve compliance with Discharge Prohibition B.2 and Receiving Water Limitation D.1. If exceedance(s) of water quality objectives or water quality standards (collectively, WQS) persist notwithstanding implementation of the SWMP and other requirements of this permit, the Permittee shall assure compliance with Discharge Prohibition B.2 and Receiving Water Limitation D.1 by complying with the following procedure:
 - a. Upon a determination by either the Permittee or the RWQCB that discharges are causing or contributing to an exceedance of an applicable water quality standard, the Permittee shall promptly notify and thereafter submit a report to the RWQCB that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the annual update to the SWMP unless the RWQCB directs an earlier submittal. The report shall include an implementation schedule. The RWQCB may require modifications to the report.
 - b. Submit any modifications to the report required by the RWQCB within 30 days of notification.
 - c. Within 30 days following approval of the report, described above, by the RWQCB EO, the Permittee shall revise the SWMP and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, implementation schedule, and any additional monitoring required.
 - d. Implement the revised SWMP and monitoring program in accordance with the approved schedule.

So long as the Permittee has complied with the procedures set forth above and is implementing the revised SWMP, the Permittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the RWQCB to develop additional BMPs.

E. STORM WATER MANAGEMENT PROGRAM REQUIREMENTS

The Permittee shall maintain, implement, and enforce an effective SWMP, and develop adequate legal authority to implement and enforce the SWMP, including right of entry/inspection, designed to reduce the discharge of pollutants from the regulated Small MS4 to the MEP and to protect water quality. The SWMP shall serve as the framework for identification, assignment, and implementation of control measures/BMPs. The Permittee shall implement the SWMP, and shall, through its continuous improvement process³, subsequently demonstrate its effectiveness and provide for necessary and appropriate revisions, modifications, and improvements to reduce pollutants in storm water discharges to MEP.

The SWMP shall be revised to adopt and incorporate any new measurable goals developed by the Permittee or any revised measurable goals identified through the Permittee's continuous improvement process. Measurable goals shall be developed or revised through a process which includes opportunities for public participation and includes appropriate external technical input and criteria for the applicability, economic feasibility, cost effectiveness, design, operation and maintenance, and include measures for evaluation of effectiveness or otherwise implementation of a control measure or best management practice so as to achieve pollutant reduction or pollution prevention benefits to MEP. The Permittee shall incorporate newly developed or updated measurable goals, acceptable to the RWQCB EO, into applicable annual revisions to the SWMP and adhere to its implementation.

1. The Permittee shall maintain, implement, and enforce an effective SWMP designed to reduce the discharge of pollutants from the regulated Small MS4 to the MEP and to protect water quality.
2. The SWMP must describe the BMPs, and associated measurable goals, that will fulfill the requirements of the following six Minimum Control Measures.
 - a. **Public Education and Outreach on Storm Water Impacts**
The Permittee must develop a public education program that educates the public on the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff. For State and federal regulated Small MS4, a facility's employee population may serve as "the public" to target for outreach and involvement.

³ Continuous Improvement shall be defined as seeking new opportunities for improving the SWMP, controlling storm water pollution, and, protecting beneficial uses. In proposing and achieving measurable goals consideration must be given to the fact that "Maximum Extent Practicable" (MEP) is an ever evolving, flexible and advancing concept. As knowledge about controlling urban runoff continues to evolve so does the definition of MEP.

State and federal facilities that discharge into medium and large MS4 may integrate public education and outreach program with the existing MS4 public education and outreach programs.

b. **Public Involvement/Participation**

The Permittee must develop a program that encourages the public to be involved in the storm water program. The Public Involvement/Participation program must, at a minimum:

- 1) Comply with State and local public notice requirements when developing, implementing, and modifying the SWMP;
- 2) Involve the public in the continuing development and refinement of the SWMP;
- 3) Encourage public participation in implementing the SWMP;
- 4) Allow the public to review the permit and SWMP; and
- 5) Include a procedure to receive and respond to comments from the public regarding the SWMP.

c. **Illicit Discharge Detection and Elimination**

The Permittee must develop, implement and enforce a program to detect and eliminate illicit discharges (as defined at 40 CFR §122.26(b)(2)) into the regulated Small MS4. At a minimum, the Permittee must:

- 1) Develop, if not already completed, a storm sewer system map, showing the location of all outfalls and the names and locations of all waters of the state and other MS4s that receive discharges from those outfalls;
- 2) Develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, to the system that are not authorized by a separate NPDES permit;
- 3) Inform public employees, businesses, and the general public of hazards including human and environmental health risks associated with illegal discharges and improper disposal of waste; and
- 4) Adopt an ordinance, policy, or other regulatory mechanism, to prohibit non-storm water discharges into the storm sewer system and implement appropriate enforcement procedures and actions, including conducting manufacturing and commercial facility inspections, to the extent allowable under federal, state or local law.

In carrying out the Illicit Discharge Detection and Elimination Program the following non-storm water discharges must only be addressed if the regulated Small MS4 or RWQCB EO identifies them as significant contributors of pollutants to the regulated Small MS4 or pose a threat to water quality standards (including the beneficial uses designated in a Water Quality Control Plan):

- 1) water line flushing;
- 2) landscape irrigation that is not reclaimed treated wastewater;
- 3) diverted stream flows;
- 4) rising ground waters;
- 5) uncontaminated ground water infiltration (as defined at 40 CFR §35.2005(20)) to separate storm sewers;
- 6) uncontaminated pumped ground water;
- 7) discharges from potable water sources;
- 8) foundation drains;
- 9) air conditioning condensate;
- 10) irrigation water that is not reclaimed treated wastewater;
- 11) springs;
- 12) water from crawl space pumps;
- 13) footing drains;
- 14) lawn watering that is not reclaimed treated wastewater;
- 15) individual residential car washing;
- 16) flows from riparian habitats and wetlands;
- 17) dechlorinated swimming pool discharges; and
- 18) discharges or flows from emergency fire fighting activities.

If a RWQCB EO determines that any individual or class of non-storm water discharge(s) listed above may be a significant source of pollutants to waters of the United States, pose a threat to water quality standards (beneficial uses) or physically interconnected MS4, the RWQCB EO may require the appropriate regulated Small MS4(s) to monitor and submit a report, and to implement BMPs on the discharge.

There may be instances when BMPs are appropriate for fire fighting flows.

d. **Construction Site Storm Water Runoff Control**

The Permittee must develop, implement, and enforce a program to ensure controls are in place that will prevent or minimize water quality impacts from storm water runoff from construction sites. Within the permit area, the program must apply to all construction projects that disturbs greater than or equal to one acre (including projects less than one acre that are part of a larger common plan of development or sale that would disturb more than

one acre) and that discharges into the Permittee's Small MS4. At a minimum, the Permittee must:

- 1) Adopt, maintain, and enforce an ordinance, policy, or other regulatory mechanism to require erosion and sediment controls at the construction sites, as well as sanctions to ensure compliance, to the extent allowable under federal, state or local law;
- 2) Require construction site operators to implement appropriate and effective erosion and sediment control BMPs that utilize Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate storm water pollution;
- 3) Require construction site operators to control all pollutant sources at the construction site that may cause adverse impacts to water quality, including, but not limited to, construction materials and waste discarded building materials, concrete truck washout, chemicals, fuel, litter, and sanitary waste;
- 4) Implement procedures for pre-construction site plan and BMP review, that incorporate consideration of potential water quality impacts from construction activities;
- 5) Implement procedures for receipt of and response to information submitted by the public regarding storm water runoff impacts due to construction projects; and
- 6) Implement procedures for site inspections and enforcement of control measures.

e. **Post-Construction Storm Water Management in New Development and Redevelopment**

The Permittee must develop, implement, and enforce a program to minimize the long term impacts of storm water runoff from new development and redevelopment projects within the permit area that disturb at least one acre (including projects disturbing less than one acre that are part of a larger common plan of development or sale that would disturb more than one acre). The program must ensure that long-term BMPs that prevent or minimize water quality impacts, are incorporated into the design of these projects. At a minimum, the program must:

- 1) Develop and implement strategies which include a combination of structural and/or non-structural best management practices appropriate for your community, and

- 2) Adopt and enforce an ordinance, policy, or other regulatory mechanism that requires projects include the incorporation, and long-term operation and maintenance of appropriate long-term BMPs.

The long-term BMPs shall reduce impacts to water quality and beneficial uses of receiving waters. The strategies employed by the MS4 must reflect the conditions of the MS4, including size, receiving waters, and amount of anticipated construction. Attachment 6 outlines an example of long-term BMPs that an MS4 may require to be incorporated into development and redevelopment projects as applicable.

Regulated small MS4s that have a population of 50,000 or more; or planned growth of more than 25 per cent over the next 10 years, must implement the design standards outlined in Attachment 6.

f. **Pollution Prevention/Good Housekeeping for Municipal Operations**

The Permittee must develop and implement an operations and maintenance program that will prevent or reduce pollutants in runoff from municipal operations. At a minimum, the Permittee must:

- 1) Consider all municipal activities and identify those that may contribute pollutants to storm water, such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, storm water system maintenance, flood management, and pesticide and herbicide use;
- 2) Select and implement BMPs which will reduce or eliminate the pollutant contributions from these activities to the MEP; and
- 3) Train new and existing employees about the impacts of storm water pollution from municipal activities and how to implement the BMPs selected to prevent and reduce these impacts.

The Permittees' SWMPs must contain local strategies for urban runoff control, including tailored measurable goals, workplans to implement measurable goals, and BMPs and Standard Operating Procedures that detail how BMPs will be carried out day-to-day.

3. The SWMP must identify the measurable goals, or Performance Standards, for each of the BMPs, including, as appropriate, the months and years for scheduled actions, including interim milestones and the frequency of the action.

4. The SWMP must identify the person or persons who will implement or coordinate the SWMP, as well as each Minimum Control Measure.

5. Termination of coverage

A Permittee may terminate coverage if a new operator has assumed responsibility for the MS4, or the Permittee has ceased operation of the MS4. To terminate coverage, the Permittee must submit a written request to the RWQCB.

6. Reliance On a Separate Implementing Entity (SIE)

The Permittee may rely on a SIE to satisfy one or more of the permit obligations, if the separate entity can appropriately and adequately address the storm water issues of the Permittee. The Permittee must describe the arrangement in the SWMP and the arrangement is subject to the approval of the RWQCB EO. The other entity must agree to implement the control measure(s), or components thereof, to achieve compliance with the General Permit. The Permittee remains responsible for compliance with this General Permit if the SIE fails to implement the control measures(s).

If the Permittee relies on a SIE that is permitted to discharge storm water under CFR Part 122 to implement all six of the Minimum Control Measures, the Permittee must note this fact in the NOI but is not required to maintain a SWMP or submit annual reports.

7. The Permittee must develop and maintain adequate legal authorities to implement all provisions of the SWMP.

8. Major outfalls not identified in the SWMP, but constructed during the term of this Order to receiving waters identified herein, shall not be considered a material change in character, location, or volume of the permitted discharge, and shall be allowed under the terms of this General Permit without permit application or permit modification, provided at least 90 days prior to construction of the outfall the Permittee submits a report that includes:

- a. Receiving water name;
- b. Storm sewer system map of added area;
- c. Drainage area (in acres);
- d. Land use designation; and
- e. Certification that the SWMP shall be amended to include the drainage area.

9. The Permittee must maintain adequate funding and staffing to implement and manage the provisions of the SWMP.

F. MONITORING PROGRAM AND REPORTING REQUIREMENTS

1. Monitoring

The primary objectives of the Monitoring Program include, but are not limited to:

- Assessing compliance with this Order;
- Measuring and improving the effectiveness of the SQMPs;
- Assessing the chemical, physical, and biological impacts of receiving waters resulting from urban runoff;
- Characterization of storm water discharges;
- Identifying sources of pollutants; and
- Assessing the overall health and evaluating long-term trends in receiving water quality.

The Regional Board may require Permittees to implement the Monitoring Program as follows:

- a. The Permittee must, on a continuous basis, conduct and document evaluation of each relevant element of its program and revise activities, control measures, BMPs, and measurable goals. These changes will be documented in the Annual Report and will be considered an enforceable component of this General Permit.
- b. The Permittee must evaluate program compliance, the appropriateness of the identified BMPs, and progress towards achieving the identified measurable goals. The following areas will be evaluated and documented in the Annual Report:
 - 1) Overall SWMP effectiveness;
 - 2) Measurable goal improvements;
 - 3) Permittee's coordination and implementation of watershed-based management actions (e.g., flood management, new development and construction, industrial source controls, public education and outreach, public involvement and participation, and monitoring);
 - 4) Partnership opportunities with other storm water programs; and
 - 5) Consistency in meeting MEP measures identified in the SWMP and with other regional, statewide, and national municipal storm water management programs.

- c. The Permittee must perform any additional monitoring as directed by the RWQCB to meet the Monitoring Program Objectives.

2. Reporting

The Permittee must submit annual reports to the appropriate RWQCB by August 15th of each year (first to be submitted in 2004), or as otherwise required by the RWQCB EO, unless exempted under Provision E.6. The report shall summarize the activities performed throughout the reporting period (July 1 through June 30) and must include:

- a. The status of compliance with permit conditions, an assessment of the appropriateness of the identified BMPs, progress towards achieving the identified measurable goals, an effectiveness evaluation, and achieving MEP for each of the Minimum Control Measures;
- b. Results of information collected and analyzed, including monitoring data, if any, during the reporting period;
- c. A summary of the storm water activities the Permittee plans to undertake during the next reporting cycle;
- d. A change in any identified BMPs or measurable goals that apply to the program elements with a justification of why the change is necessary; and
- e. A change in the person or persons implementing and coordinating the SWMP.

3. Recordkeeping

The Permittee must keep records required by this permit for at least five years or the duration of the General Permit if continued. The RWQCB EO may specify a longer time for record retention. The Permittee must submit the records to the RWQCB EO only when specifically asked to do so. The Permittee must make the records, including the permit and SWMP, available to the public during regular business hours.

4. Noncompliance Reporting

Permittees who cannot certify compliance and/or who have had other instances of noncompliance shall notify the appropriate RWQCB within 30 days. The notifications shall identify the noncompliance event and an initial assessment of

any impact caused by the event, describe the actions necessary to achieve compliance, and include a time schedule indicating when compliance will be achieved. The time schedule and corrective measures are subject to modification by the RWQCB EO.

G. REGIONAL WATER QUALITY CONTROL BOARD AUTHORITIES

The RWQCBs and their staff will oversee the General Permit by reviewing and requiring changes to SWMPs and other submissions, imposing region-specific monitoring requirements, reviewing reports, conducting inspections, and taking enforcement actions against permit violators.

H. STANDARD PROVISIONS

1. General Authority

Three of the minimum control measures (illicit discharge detection and elimination, and the two construction-related measures) require enforceable controls on third party activities to ensure successful implementation of the measure. Some Federal and State operators, however, may not have the necessary legal regulatory authority to adopt these enforceable controls. As in the case of local governments that lack such authority, State and Federal MS4s are expected to utilize the authority they do possess and to seek cooperative arrangements.

2. Duty to Comply

The Permittee must comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the CWA and the Porter-Cologne Water Quality Control Act (Porter-Cologne) and is grounds for enforcement action and/or removal from General Permit coverage. In the event that the Permittee is removed from coverage under the General Permit, the Permittee will be required to seek coverage under an individual or alternative general permit.

1. General Permit Actions

This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not nullify any General Permit condition.

If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under §307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the

pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and Permittee so notified.

2. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

3. Duty to Mitigate

The Permittee shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit that has a reasonable likelihood of adversely affecting human health or the environment.

4. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this General Permit and with the requirements of the SWMP. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by the Permittee when necessary to achieve compliance with the conditions of this General Permit.

5. Property Rights

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of federal, State, or local laws or regulations.

6. Duty to Provide Information

The Permittee shall furnish the RWQCB, SWRCB, or U.S. EPA, during normal business hours, any requested information to determine compliance with this General Permit. The Permittee shall also furnish, upon request, copies of records required to be kept by this General Permit.

8. Inspection and Entry

The Permittee shall allow the RWQCB, SWRCB, U.S. EPA, or an authorized representative of the RWQCB, SWRCB, or U.S. EPA, upon the presentation of credentials and other documents as may be required by law, to:

- a. Enter upon the Permittee's premises during normal business hours where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- b. Access and copy, during normal business hours, any records that must be kept under the conditions of this General Permit;
- c. Inspect during normal business hours any municipal facilities; and
- d. Sample or monitor at reasonable times for the purpose of assuring General Permit compliance.

9. Signatory Requirements

All NOIs, SWMPs, certifications, reports, or other information prepared in accordance with this General Permit submitted to the SWRCB or RWQCB shall be signed by either a principal executive officer, ranking elected official, or duly authorized representative. The principal executive officer of a Federal agency includes the chief executive officer of the agency or the senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of U.S. EPA).

10. Certification

Any person signing documents under Section G.9 above, shall make the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

11. Anticipated Noncompliance

The Permittee will give advance notice to the RWQCB and local storm water management agency of any planned changes in the regulated Small MS4 activity that may result in noncompliance with General Permit requirements.

12. Penalties for Falsification of Reports

Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than two years or by both.

13. Penalties for Violations of Permit Conditions

- a. Part 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Parts 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Part 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed \$27,500 per calendar day of such violation, as well as any other appropriate sanction provided by Part 309 of the CWA.
- b. Porter-Cologne also provides for administrative, civil, and criminal penalties, which in some cases are greater than those under the CWA.

14. Oil and Hazardous Substance Liability

Nothing in this General Permit shall be construed to preclude the institution of any legal action against the Permittee or relieve the Permittee from any responsibilities, liabilities, or penalties to which the Permittee is or may be subject to under Part 311 of the CWA.

15. Severability

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

16. Reopener Clause

This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, or otherwise in accordance with 40 CFR sections 122.62, 122.63, 122.64, and 124.5.

17. Availability

A copy of this General Permit and the SWMP shall be made available for public review.

18. Transfers

This General Permit is not transferable. A Permittee must submit written notification to the appropriate RWQCB to terminate coverage of this permit.

19. Continuation of Expired Permit

This General Permit expires five years from the date of adoption. This General Permit continues in force and in effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those Small MS4s authorized to discharge under the expiring General Permit are covered by the continued General Permit.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the SWRCB held on _____.

AYE:

NO:

ABSENT:

ABSTAIN

Maureen Marche
Administrative Assistant to the Board

Attachment 1

Operators of Municipal Separate Storm Sewer Systems that serve areas within urbanized areas are automatically designated as regulated Small MS4s. These include the following areas. (For cities, the permit area boundary is the city boundary. For counties, permit boundaries must at least be inclusive of urbanized areas. The boundaries must be proposed in the permit application and may be developed in conjunction with the applicable regional water quality control board.)

Region 1

City of Cotati
Graton, County of Sonoma
City of Healdsburg
City of Rohnert Park
City of Sebastapool
Town of Windsor
County of Sonoma

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Region 2

City of Belvedere
City of Benicia
Black Point-Green Point, County of Marin
Town of Corte Madera
Town of Fairfax
City of Larkspur
Lucas Valley-Marinwood, County of Marin
City of Mill Valley
City of Napa
City of Novato
City of Petaluma
Town of Ross
Town of San Anselmo
City of San Francisco
City of San Rafael
City of Sausalito
City of Tamalpais-Homestead Valley
City of Tiburon
Woodacre, County of Marin
County of Napa
County of Marin
County of Sonoma
County of San Francisco

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Region 3

Aptos, County of Santa Cruz
City of Atascadero
City of Capitola
City of Carmel-by-the-Sea
Carmel Valley Village, County of Monterey
City of Carpinteria

T

Attachment 1

Castroville, County of Monterey
City of Del Ray Oaks
City of Gilroy
Goleta, County of Santa Barbara
Isla Vista, County of Santa Barbara
Las Lomas, County of Santa Cruz
Live Oak, County of Santa Cruz
City of Lompoc
City of Marina

D

Montecito, County of Santa Barbara
City of Monterey
City of Morgan Hill
Nipomo, County of San Luis Obispo
Orcutt, County of Santa Barbara
City of Pacific Grove
City of Paso Robles
Pajaro, County of Monterey
Pebble Beach, County of Monterey
Prunedale, County of Monterey
City of San Luis Obispo
City of Santa Barbara

R

City of Santa Cruz
City of Santa Maria
City of Scotts Valley
City of Seaside
Spreckles, County of Monterey
City of Watsonville
Templeton, County of San Luis Obispo
San Martin, County of Santa Clara
City of Sand City

A

Vandenberg Air Force Base
Vandenberg Village, County of Santa Barbara
County of Monterey
County of San Luis Obispo
County of Santa Barbara
County of Santa Clara
County of Santa Cruz

F

Region 5

City of Anderson
City of Atwater
City of Auburn
Bondelle Ranchos, County of Madera
City of Ceres
City of Chico
City of Davis
City of Delhi
City of Durham

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Attachment 1

Easton, County of Fresno
El Dorado Hills, County of El Dorado
Empire, County of Stanislaus
City of Exeter
City of Farmersville
French Camp, County of San Joaquin
City of Goshen

D

City of Houghson
Granite Bay, County of Placer
Kennedy, County of San Joaquin
Keyes, County of Stanislaus

R

City of Lathrop
Linda, County of Yuba
City of Lodi

Town of Loomis
City of Madera
Madera Acres, County of Madera
City of Manteca
City of Marysville
City of Merced

Morada, County of San Joaquin
North Auburn, County of Placer
North Woodbridge, County of San Joaquin
Olivehurst, County of Yuba

A

City of Porterville
City of Redding
City of Ripon

City of Riverbank
City of Rocklin
City of Roseville

Salida, County of Stanislaus
City of Shasta Lake

Strathmore, County of Tulare
South Yuba City, County of Sutter

F

City of Tracy

City of Turlock

City of Vacaville

City of Visalia

City of West Sacramento

City of Winton

City of Yuba City

County of Butte

County of Madera

County of Merced

County of Placer

County of San Joaquin

County of Shasta

County of Solano

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Attachment 1

County of Stanislaus
County of Sutter
County of Tulare
County of Yolo
County of Yuba

Region 6

City of Apple Valley
City of Hesperia
City of Lancaster
City of Palmdale
City of Victorville
County of San Bernadino
County of Los Angeles

Region 7

City of El Centro
Heber, County of Imperial
City of Winterhaven
County of Imperial

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Attachment 2

Operators of Municipal Separate Storm Sewer Systems that serve areas that are designated by the State Water Resources Control Board or Regional Water Quality Control Board in accordance with the designation criteria contained in the General Permit are regulated Small MS4s. These include, but are not limited to, the following areas. (For cities, the permit area boundary is the city boundary. For counties, permit boundaries must at least be inclusive of urbanized areas. The boundaries must be proposed in the permit application and may be developed in conjunction with the applicable regional water quality control board.)

Region 1

Area	Justification	Details
City of Arcata	<ul style="list-style-type: none"> Discharge into a sensitive water body High population density 	<ul style="list-style-type: none"> Mad River which is on the 303(d) list for sediment and turbidity Urban cluster

Region 2

Area	Justification	Details
City of Calistoga	<ul style="list-style-type: none"> High population density 	<ul style="list-style-type: none"> Urban cluster
City of St. Helena	<ul style="list-style-type: none"> High population density 	<ul style="list-style-type: none"> Urban cluster
City of Sonoma	<ul style="list-style-type: none"> High population density 	<ul style="list-style-type: none"> Urban cluster
City of Yountville	<ul style="list-style-type: none"> High population density 	<ul style="list-style-type: none"> Urban cluster

Region 3

Area	Justification	Details
County of San Luis Obispo around Baywood-Los Osos area	<ul style="list-style-type: none"> Discharge into a sensitive water body High population density 	<ul style="list-style-type: none"> Morro Bay which is on the 303(d) list for sediments Urban cluster
City of Morro Bay	<ul style="list-style-type: none"> Discharge into a sensitive water body High population density 	<ul style="list-style-type: none"> Morro Bay which is on the 303(d) list for sediments Urban area

Region 5

Area	Justification	Details
City of Clearlake	<ul style="list-style-type: none"> Discharge into a sensitive water body High population density 	<ul style="list-style-type: none"> Clear Lake which is on the 303(d) list for mercury and nutrients Urbanized cluster
City of Fowler	<ul style="list-style-type: none"> High population density 	<ul style="list-style-type: none"> Urban cluster
City of Grass Valley	<ul style="list-style-type: none"> Discharge to sensitive water bodies High growth potential High population density 	<ul style="list-style-type: none"> Wolf Creek and Deer Creek which support threatened and endangered species Urban cluster

Attachment 2

City of Hanford	<ul style="list-style-type: none"> • High growth or growth potential • High population density 	<ul style="list-style-type: none"> • 34.9% over 10 years • Urban cluster
City of Kingsburg	<ul style="list-style-type: none"> • High population density 	<ul style="list-style-type: none"> • Urban cluster
City of Lakeport	<ul style="list-style-type: none"> • Discharge to sensitive water bodies • High population density 	<ul style="list-style-type: none"> • Clear Lake which is on the 303(d) list for mercury and nutrients • Urban cluster
City of Lincoln	<ul style="list-style-type: none"> • High growth and growth potential • Discharge to sensitive water bodies • High population density 	<ul style="list-style-type: none"> • 54.6% over 10 years and continuing at 15% per year • Receiving waters support threatened and endangered species • Urban cluster
City of Los Baños	<ul style="list-style-type: none"> • High growth • Discharge into a sensitive water body • High population density 	<ul style="list-style-type: none"> • 78.2% growth over 10 years • Los Baños Canal which is used for agriculture supply and flows into a water of the U.S. • Urban cluster
City of Oakdale	<ul style="list-style-type: none"> • High growth • Discharge to sensitive water body • High population density 	<ul style="list-style-type: none"> • 29.6% over 10 years • Stanislaus River which is on the 303(d) list for pesticides and unknown toxicity • Urban cluster
City of Patterson	<ul style="list-style-type: none"> • High growth • Discharge to sensitive water body • High population density 	<ul style="list-style-type: none"> • 34.5% over 10 years • San Joaquin river which is on the 303(d) list for pesticides, and unknown toxicity • Urban cluster
City of Placerville	<ul style="list-style-type: none"> • Discharge to sensitive water body • High population density 	<ul style="list-style-type: none"> • Hangtown Creek, Emigrant Ravine Creek, Cedar Ravine Creek, and Cedar Ravine Creek which support threatened and endangered species • Urban cluster
City of Reedley	<ul style="list-style-type: none"> • Discharge into sensitive water body • High population density 	<ul style="list-style-type: none"> • Kings River, used for recreation and agriculture supply • Urban cluster
Rio Vista	<ul style="list-style-type: none"> • Discharge to sensitive water body • High population growth potential 	<ul style="list-style-type: none"> • Sacramento River, Delta, which is on the 303(d) list for pesticides, mercury, and unknown toxicity

Attachment 2

	<ul style="list-style-type: none"> High population density 	<ul style="list-style-type: none"> 210% projected growth between 2000 and 2010 Urban cluster
City of Selma	<ul style="list-style-type: none"> Discharge into sensitive water body High population density 	<ul style="list-style-type: none"> Urban cluster
City of Tulare	<ul style="list-style-type: none"> High growth Contributor of pollutants to waters of the U.S. High population density 	<ul style="list-style-type: none"> 32.3% growth over 10 years High population, approaching "urbanized area" Urban cluster
City of Woodland	<ul style="list-style-type: none"> Significant contributor of pollutants to waters of the U.S. High population density 	<ul style="list-style-type: none"> 49,151 people at the time of the census, essentially the same threat as an urbanized area Urban cluster
County of Lake	<ul style="list-style-type: none"> Discharge to sensitive water bodies High population density 	<ul style="list-style-type: none"> Clear Lake which is on the 303(d) list for mercury and nutrients Urban cluster

Region 6

Area	Justification	Details
City of Adelanto	<ul style="list-style-type: none"> High population growth High population density 	<ul style="list-style-type: none"> 112% over 10 years Urban cluster
City of Barstow	<ul style="list-style-type: none"> Discharge to sensitive water body High population density 	<ul style="list-style-type: none"> Mojave River which is on the 303(d) list for priority organics Urban cluster

Region 7

Area	Justification	Details
City of Brawly	<ul style="list-style-type: none"> Discharge to sensitive water body High population density 	<ul style="list-style-type: none"> New River which is on the 303(d) list for bacteria, nutrients, pesticides, and sedimentation Urban cluster
City of Calexico	<ul style="list-style-type: none"> Discharge to sensitive water body High population density 	<ul style="list-style-type: none"> Salton Sea which is on the 303(d) list for nutrients Urban cluster

**INSTRUCTIONS FOR COMPLETING THE NOI TO COMPLY WITH THE TERMS OF THE
GENERAL PERMIT FOR STORM WATER DISCHARGES FROM SMALL MUNICIPAL
SEPARATE STORM SEWER SYSTEMS**

(ORDER No.)

Applicability

Each entity or group of entities, if working together as co-permittees, seeking permit coverage under this General Permit must submit a completed NOI

When to submit

An NOI must be submitted by March 10, 2003, or 180 days after designation notification by the Regional Water Quality Control Board (RWQCB) or SWRCB, whichever is later.

Where to submit

The NOI and applicable attachments must be submitted to the appropriate RWQCB office. A map and list of contact information for each RWQCB may be found in Attachment __ of this General Permit

Questions

If you have questions regarding this General Permit, you may call the RWQCB that has jurisdiction over the area you are in or the SWRCB. Contact information may be found in Attachment __ of this General Permit.

Line-by-Line Instructions

I. Discharger Information

Check the box that corresponds to the permitting option you wish to apply for. If you are applying to be a co-permittee, an appropriate official representing each agency who will participate in the area-wide permit must sign on the lines provided certifying the agency will be a co-permittee with the other agencies listed to implement a storm water program in the combined designated areas of each of the agency's jurisdiction. The agency to act as the Lead Agency (the entity responsible for being the main contact with the RWQCB for permit administration) shall start the list. If more than four agencies will act as co-permittees, continue the list on a separate page.

Each agency must also complete a separate Information Sheet or Separate Implementing Entity Form. (See accompanying sheets for instructions for these sheets.)

II. Permit Area

General name of the permit area, such as the Sacramento Metropolitan Area

III. Boundaries of Coverage

Describe the boundaries of the area to be permitted and include a site map. For a city, this would be the established city boundaries. For a county, unless the entire county is designated, the permitted area should be inclusive of the area of concern and rely on simplified boundaries for each general direction, such as rivers, major roads or highways, or an adjoining city's boundary. For other governmental facilities, the property line shall serve as the permit boundary.

IV. Fees

Enter the resident population of people living within the applicant's permitted area. Check the box that corresponds to the entered population. Submit the indicated fee amount with the NOI package to the Regional Board.

State Water Resources Control Board

NOTICE OF INTENT
TO COMPLY WITH THE TERMS OF THE GENERAL PERMIT
FOR
STORM WATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER
SYSTEMS
(WQ ORDER No.)

I. DISCHARGER INFORMATION (check applicable box(es) and complete corresponding information)

<input type="checkbox"/> Applying for individual General Permit Coverage	Complete and submit the attached Information Sheet
<input type="checkbox"/> Applying for a permit with one or more co-permittee	<p>The undersigned agree to work as co-permittees in implementing a complete small MS4 storm water program. The program must comply with the requirements found in Title 40 of the Code of Federal Regulations, parts 122.32. Attach additional sheets if necessary. Each co-permittee must complete an attached Information Sheet.</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Lead Agency _____</p> <p>Agency _____</p> <p>Agency _____</p> <p>Agency _____</p> </div> <div style="width: 45%;"> <p>Signature of Official _____</p> <p>Signature of Official _____</p> <p>Signature of Official _____</p> <p>Signature of Official _____</p> </div> </div>
<input type="checkbox"/> Relying on Separate Implementing Entity	Complete and submit the attached the Separate Implementing Entity Form

II. PERMIT AREA:

III. BOUNDARIES OF COVERAGE (include a site map with the submittal)

VI. FEES

Total Population: _____

Enclosed Filing Fee (check one)

Less than 50,000 people

<input type="checkbox"/> Less than 100,000 people	
<input type="checkbox"/> Greater than or equal to 100,000 people	

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INSTRUCTIONS FOR COMPLETING THE INFORMATION SHEET
ATTACHMENT TO THE NOI TO COMPLY WITH THE TERMS OF THE GENERAL
PERMIT FOR STORM WATER DISCHARGES FROM SMALL MS4s
(ORDER No.)

I. NOI STATUS

Check box "1" if this is a new NOI submittal. Check box "2" if you are reporting changes to the NOI (e.g., new contact person, phone number, mailing address). Include the facility WDID number and highlight all the information that has been changed. The appropriate official must sign the form, certifying the changes.

II. AGENCY INFORMATION

- A. Enter the name of the agency applying for coverage.
- B. Enter the first and last name of the person familiar with the permit and responsible for permit compliance.
- C. Enter the phone number where the contact person can be reached.
- D. Enter the agency's mailing address.
- E. Enter the agency's mailing address city.
- F. Enter the agency's mailing address zip code.
- G. Enter the county in which the agency is located. If the agency is located in more than one county, list all applicable counties. Attach additional sheets if necessary.
- H. Check the box that corresponds to the agency owner.

III. CERTIFICATION

- A. Print the name of the appropriate official. For a municipality, State, Federal, or other public agency this would be a principal executive officer, ranking elected official, or duly authorized representative. The principal executive officer of a Federal agency includes the chief executive officer of the agency or the senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of USEPA).
- B. The person whose name is printed in box IV.A must sign the Information Sheet.
- C. Provide the date on which the Information Sheet was signed.
- D. Enter the professional title of the person signing this Information Sheet.

INFORMATION SHEET
ATTACHMENT TO THE
NOTICE OF INTENT TO COMPLY WITH THE TERMS OF THE GENERAL PERMIT
FOR
STORM WATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS
(WQ ORDER No.)

I. NOI STATUS

Mark Only One Item	1. <input type="checkbox"/> New Permittee	2. <input type="checkbox"/> Change of Information for WDID#	
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II. AGENCY INFORMATION

A. Name					
B. Contact Person				C. Phone	
D. Mailing Address					
E. City			F. Zip		G. County
H. Operator Type					
(check one) 1. <input type="checkbox"/> City 2. <input type="checkbox"/> County 3. <input type="checkbox"/> State 4. <input type="checkbox"/> Federal 5. <input type="checkbox"/> Special District 6. <input type="checkbox"/> Government Combination					

III. CERTIFICATION

<p>"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. Additionally, I certify that the provisions of the permit, including the development and implementation of a Storm Water Management Program, will be complied with."</p>		
A. Printed Name: _____		
B. Signature: _____		C. Date: _____
D. Title: _____		

SEPARATE IMPLEMENTING ENTITY (SIE) FORM

ATTACHMENT TO THE
NOTICE OF INTENT TO COMPLY WITH THE TERMS OF THE GENERAL PERMIT FOR
STORM WATER DISCHARGES FROM SMALL MS4s
(WQ ORDER No.)

I. NOI STATUS

Mark Only One Item 1. ☐ New Permittee 2. ☐ Change of Information for WDID#

II. AGENCY INFORMATION

A. Name					
B. Contact Person				C. Phone	
D. Mailing Address					
E. City		F. Zip		G. County	
H. Operator Type (check one) 1. <input type="checkbox"/> City 2. <input type="checkbox"/> County 3. <input type="checkbox"/> State 4. <input type="checkbox"/> Federal 5. <input type="checkbox"/> Special District 6. <input type="checkbox"/> Government Combination					

III. SEPARATE PROGRAM

Minimum Control Measure(s) being implemented by a separate entity	1.
	2.
	3.
	4.
	5.
	6.

IV. IMPLEMENTING ENTITY

A. Separate Implementing Entity Name					
B. Contact Person				C. Phone	
D. Mailing Address					
E. City		F. Zip		G. County	
H. Operator Type (check one) 1. <input type="checkbox"/> City 2. <input type="checkbox"/> County 3. <input type="checkbox"/> State 4. <input type="checkbox"/> Federal 5. <input type="checkbox"/> Special District 6. <input type="checkbox"/> Government Combination					
I. "I agree to implement a storm water program that meets the requirements of Order 02-XXX and coordinate applicable parts of that program with the agency identified in section II of this form."					
Signature of Official				Date	

IV. CERTIFICATION

<p>"I agree to coordinate with the agency identified in Section III of this form and comply with its qualifying storm water program. I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. Additionally, I certify that the provisions of the permit, including the development and implementation of a Storm Water Management Program, will be complied with."</p>	
A. Printed Name: _____	

B. Signature: _____	C. Date: _____
D. Title: _____	

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**INSTRUCTIONS FOR COMPLETING THE
IMPLEMENTING ENTITY FORM
ATTACHMENT TO THE NOI TO COMPLY WITH THE TERMS OF THE GENERAL PERMIT
FOR STORM WATER DISCHARGES FROM SMALL MS4s
(ORDER No.)**

I. NOI STATUS

Check box "1" if this is a new NOI registration. Check box "2" if you are reporting changes to the NOI (e.g., new contact person, phone number, mailing address). Include the facility WDID number and highlight all the information that has been changed. The appropriate official must sign the form, certifying the changes.

II. AGENCY INFORMATION

- A. Enter the name of the agency applying for coverage.
- B. Enter the first and last name of the person familiar with the permit and responsible for permit compliance.
- C. Enter the phone number where the contact person can be reached.
- D. Enter the agency's mailing address
- E. Enter the agency's mailing address city.
- F. Enter the agency's mailing address zip code.
- G. Enter the county in which the agency is located. If the agency is located in more than one county, list all applicable counties. Attach additional sheets if necessary.
- H. Check the box that corresponds to the agency owner.

III. SEPARATE PROGRAM

List all of the Minimum Control Measure(s) that will be implemented by the SIE. If the program you are relying on includes multiple co-permittees, use the Lead Agency to complete this form.

IV. IMPLEMENTING ENTITY (If more than one entity is implementing programs, use a different form for each SIE.)

- A. Enter the name of the agency applying for coverage.
- B. Enter the first and last name of the person familiar with the permit and responsible for permit compliance.
- C. Enter the phone number where the contact person can be reached.
- D. Enter the agency's mailing address
- E. Enter the agency's mailing address city.
- F. Enter the agency's mailing address zip code
- G. Enter the county in which the agency is located. If the agency is located in more than one county, list all applicable counties. Attach additional sheets if necessary.
- H. Check the box that corresponds to the agency owner.
- I. Certification by an appropriate SIE official that the SIE agrees to include the agency in implementing the SWMP. For a municipality, State, Federal, or other public agency the appropriate official would be a principal executive officer, ranking elected official or duly authorized representative. The principal executive officer of a Federal agency includes the chief executive officer of the agency or the senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of USEPA).

SIE FORM INSTRUCTIONS CONTINUED

V. CERTIFICATION

- A. Print the name of the appropriate official. For a municipality, State, Federal, or other public agency this would be a principal executive officer, ranking elected official or duly authorized representative. The principal executive officer of a Federal agency includes the chief executive officer of the agency or the senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of USEPA).
- B. The person whose name is printed in box IV must sign the Information Sheet.
- C. Provide the date on which the Information Sheet was signed.
- D. Enter the professional title of the person signing the NOI.

DR

A

F

T

STATE WATER RESOURCES CONTROL BOARD

Division of Water Quality

Attention: Storm Water Section

P.O. Box 1977

Sacramento, CA 95812-1977

(916) 341-5539 FAX: (916) 341-5543

Web Page: <http://www.swrcb.ca.gov/stormwtr/index.html>

Email: stormwater@dwq.swrcb.ca.gov

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARDS

NORTH COAST REGION (1)

5550 Skylane Blvd., Ste. A

Santa Rosa, CA 95403

(707) 576-2220 FAX: (707) 523-0135

Web Page: <http://www.swrcb.ca.gov/rwqcb1>

SAN FRANCISCO BAY REGION (2)

1515 Clay Street, Ste. 1400

Oakland, CA 94612

(510) 622-2300 FAX: (510) 622-2460

Web Page: <http://www.swrcb.ca.gov/rwqcb2>

CENTRAL COAST REGION (3)

81 Higuera Street, Ste. 200

San Luis Obispo, CA 93401-5427

(805) 549-3147 FAX: (805) 543-0397

Web Page: <http://www.swrcb.ca.gov/rwqcb3>

LOS ANGELES REGION (4)

320 W. 4th Street, Ste. 200

Los Angeles, CA 90013

(213) 576-6600 FAX: (213) 576-6640

Web Page: <http://www.swrcb.ca.gov/rwqcb4>

LAHONTAN REGION (6 SLT)

2501 Lake Tahoe Blvd.

South Lake Tahoe, CA 96150

(530) 542-5400 FAX: (530) 544-2271

Web Page: <http://www.swrcb.ca.gov/rwqcb6>

VICTORVILLE BRANCH OFFICE (6V)

15428 Civic Drive, Ste. 100

Victorville, CA 92392-2383

(760) 241-6583 FAX: (760) 241-7308

Web Page: <http://www.swrcb.ca.gov/rwqcb6>

CENTRAL VALLEY REGION (5S)

3443 Routier Road, Ste. A

Sacramento, CA 95827-3098

(916) 255-3000 FAX: (916) 255-3015

Web Page: <http://www.swrcb.ca.gov/rwqcb5>

FRESNO BRANCH OFFICE (5F)

3614 East Ashlan Avenue

Fresno, CA 93726

(559) 445-5116 FAX: (559) 445-5910

Web Page: <http://www.swrcb.ca.gov/rwqcb5>

REDDING BRANCH OFFICE (5R)

415 Knollcrest Drive, Ste. 100

Redding, CA 96002

(530) 224-4845 FAX: (530) 224-4857

Web Page: <http://www.swrcb.ca.gov/rwqcb5>

COLORADO RIVER BASIN REGION (7)

73-720 Fred Waring Dr., Ste. 100

Palm Desert, CA 92260

(760) 346-7491 FAX: (760) 341-6820

Web Page: <http://www.swrcb.ca.gov/rwqcb7>

SANTA ANA REGION (8)

California Tower

3737 Main Street, Ste. 500

Riverside, CA 92501-3339

(909) 782-4130 FAX: (909) 781-6288

Web Page: <http://www.swrcb.ca.gov/rwqcb8>

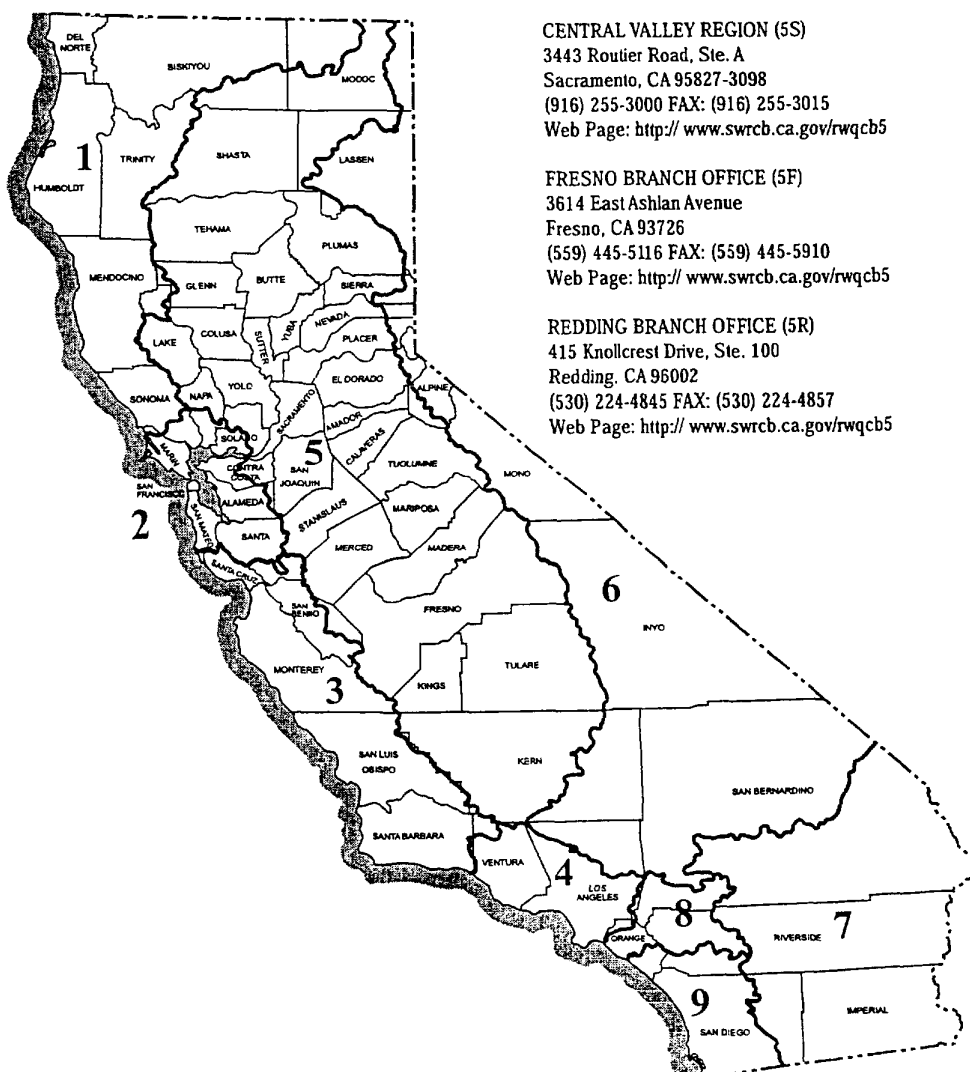
SAN DIEGO REGION (9)

9174 Sky Park Court, Suite 100

San Diego, CA 92123

(858) 467-2952 FAX: (858) 571-6972

Web Page: <http://www.swrcb.ca.gov/rwqcb9>



STATE OF CALIFORNIA
Gray Davis, Governor

CALIFORNIA ENVIRONMENTAL
PROTECTION AGENCY
Winston H. Hickox, Secretary

STATE WATER RESOURCES
CONTROL BOARD
Arthur Baggett Jr., Chair

Example Design Standards

This Attachment provides an example of Post-Construction requirements that a Small MS4 may adopt and subsequently require developers in the permit area to implement into their projects. While an approach similar to this example is appropriate all for Small MS4s, there are other post-construction BMPs to incorporate that may make the requirements for developers more or less prescriptive, including providing specific categories of development to require Design Standards, reducing the threshold area requiring Design Standards, or modifying the particular Design Standards required. The requirements would be adopted by the MS4 to be included in the design phase of any private or public development. The MS4 must check that post-construction measures are incorporated during plan review and during construction and maintained throughout the life of the project. While there is some flexibility in how to comply with the Post-Construction Minimum Control Measure, the implementation of the requirements must result in the reduction of pollutants in the MS4's storm water discharge to the MEP.

Design Standards are applicable to all development projects that disturb greater than or equal to one acre of land (or are part of a larger common plan of development that disturbs more than once acre), or significant redevelopment projects.

DESIGN STANDARDS

A. CONSERVE NATURAL AREAS

- Concentrate or cluster Development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands and restore areas that provide water quality functions.

B. VOLUME AND FLOW CONTROL

Structural or Treatment control BMPs selected for use at any project covered by these Design Standards shall comply with the following requirements unless specifically exempted.

Post-construction Structural or Treatment Control BMPs shall be designed to:

1. Infiltrate or treat storm water runoff from either:

- a). The 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, or
- b). The volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook – Industrial/ Commercial, (1993)*, or
- c). The volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for “treatment” (an average specific to the permit area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event,

AND

2. Control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the permitted Small MS4.

C. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Storm water runoff from a site has the potential to contribute oil and grease, suspended solids, trash, heavy metals, petroleum products, pesticides, herbicides, fertilizers, PAHs, oxygen demanding substances, and pathogens to the storm water conveyance system. To reduce the discharge of pollutants from the MS4, the development must be designed so as to minimize the introduction of pollutants to the MS4. There are a variety of BMPs that can be incorporated into developments to do this.

In meeting this specific requirement, “minimization of the pollutants of concern” will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the Maximum Extent Practicable. Those BMPs best suited for that purpose are those listed in the *California Storm Water Best Management Practices Handbooks; Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide; Manual for Storm Water Management in Washington State; The Maryland Stormwater Design Manual; Florida Development Manual: A Guide to Sound Land and Water Management; Denver Urban Storm Drainage Criteria Manual, Volume 3 – Best Management Practices and Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*, USEPA Report No. EPA-840-B-92-002, as “likely to have significant impact” beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated, may in a particular circumstance, be better suited to maximize the reduction of the pollutants. Examples of BMPs that can be used for minimizing the introduction of pollutants of concern generated from site runoff are identified in Table 2.

At a minimum, the following Structural BMPs must be included where applicable (i.e., if the project includes loading docks, loading docks shall be designed and constructed as specified below):

1. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water runoff or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater/leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for washing/steam cleaning of vehicles and equipment. The area in the site design must be:

- Self-contained and/ or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

4. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

The activity of outdoor equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and

suspended solids to the storm water conveyance system. Include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must be:

- Self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If the wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

5. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and fuels to the storm water conveyance system. Therefore, design plans, which include fueling areas, must contain the following:

- The fuel dispensing area should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.
- The fuel dispensing areas must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

6. PROPERLY DESIGN PARKING AREA

Parking lots may accumulate pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons that are deposited on parking lot surfaces by motor vehicles. These pollutants are directly transported to surface waters. To minimize the offsite transport of pollutants, the following design criteria are required:

- Reduce impervious land coverage of parking areas
- Infiltrate runoff before it reaches storm drain system
- Treat runoff before it reaches storm drain system

Particular attention should be given to ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging.

7. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials. Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the storm water conveyance system. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the storm water conveyance system, the following Structural Treatment BMPs are required:

- Materials with the potential to contaminate storm water must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- The storage area must have a roof or awning to minimize collection of storm water within the secondary containment area.

8. PROPERLY DESIGN TRASH STORAGE AREAS

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes. Trash storage areas must comply with the following requirements (individual, single family residences are exempt from these requirements).

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.
- Trash containers must be covered.
- If drainage within the storage area is required, such drainage should be made to the sanitary sewer with appropriate pre-treatment (e.g. grease traps).

D. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly.

As part of project review, if a project applicant has included or is required to include, Structural or Treatment Control BMPs in project plans, the Permittee shall require that

the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.

For all properties, the verification shall include:

1. The developer's signed statement, as part of the project application, accepting responsibility for all structural and treatment control BMP maintenance until the time the property is transferred;
2. Printed educational materials providing information on the storm water management facilities present, signs that maintenance is needed, and how the necessary maintenance can be performed; and
3. Where the property will be transferred to a public entity, a signed agreement from the public entity assuming responsibility for Structural or Treatment Control BMP maintenance.

The transfer of property to a private or public owner must have conditions requiring the recipient to assume responsibility for maintenance of any Structural or Treatment Control BMP to be included in the sales or lease agreement for that property, and will be the owner's responsibility. The condition of transfer shall include a provision that the property owners conduct maintenance inspection of all Structural or Treatment Control BMPs at least once a year and retain proof of inspection. The printed educational materials, highlighting the BMPs and their maintenance requirements, shall be required to accompany the first and any subsequent deed transfers.

For residential properties where the Structural or Treatment Control BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&Rs).

If Structural or Treatment Control BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency.

E. WAIVER

A Permittee may, through adoption of an ordinance or code incorporating the treatment requirements of the Post-Construction Minimum Control Measure, provide for a waiver from the requirement if impracticability for a specific property can be established. A waiver of impracticability shall be granted only when all other source control and Structural or Treatment Control BMPs have been considered and rejected as infeasible. Recognized situations of impracticability include, (i) extreme limitations of space for treatment on a redevelopment project, (ii) unfavorable or unstable soil conditions at a site to attempt infiltration, and (iii) risk of ground water contamination because a known

unconfined aquifer lies beneath the land surface or an existing or potential underground source of drinking water is less than 10 feet from the soil surface. Any other justification for impracticability must be separately petitioned by the Permittee and submitted to the Regional Board for consideration. The Regional Board may consider approval of the waiver justification or may delegate the authority to approve a class of waiver justifications to the Regional Board Executive Officer. The supplementary waiver justification becomes recognized and effective only after approval by the Regional Board or the Regional Board Executive Officer. A waiver granted by a Permittee to any development or redevelopment project may be revoked by the Regional Board Executive Officer for cause and with proper notice upon petition.

If a waiver is granted for impracticability, the Permittee must require the project proponent to transfer the savings in cost, as determined by the Permittee, to a storm water mitigation fund operated by a public agency or a non-profit entity. The funds shall be used to promote regional or alternative solutions for storm water pollution in the watershed.

F. LIMITATION ON USE OF INFILTRATION BMPs

Four factors significantly influence the potential for storm water to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in storm water, (iii) soluble fraction of pollutant, and (iv) soil type. The risk of contamination of groundwater may be reduced by pretreatment of storm water. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration*, Report No. EPA/600/R-94/051, USEPA (1994).

To protect groundwater quality, the Permittee shall apply restrictions to the use of structural treatment BMPs which are designed to primarily function as infiltration devices (such as infiltration trenches and infiltration basins). Such restrictions shall ensure that the use of such infiltration structural treatment BMPs shall not cause or contribute to an exceedance of groundwater quality objectives. ¹ A minimum, use of structural treatment BMPs which are designed to primarily function as infiltration devices shall meet the following conditions¹.

1. Urban runoff shall undergo pretreatment such as sedimentation or filtration prior to infiltration
2. All dry weather flows shall be diverted from infiltration devices.
3. Pollution prevention and source control BMPs shall be implemented at a level appropriate to protect groundwater quality at sites where infiltration structural treatment BMPs are to be used.

¹ These conditions do not apply to structural treatment BMPs which allow incidental infiltration and are not designed to primarily function as infiltration devices (such as grassy swales, detention basins, vegetated buffer strips, constructed wetlands, etc.).

4. Infiltration structural treatment BMPs shall be adequately maintained so that they remove pollutants to the maximum extent practicable.
5. The vertical distance from the base of any infiltration structural treatment BMP to the seasonal high groundwater mark shall be at least 10 feet.
6. The soil through which infiltration is to occur shall have physical and chemical characteristics (such as appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of urban runoff for the protection of groundwater beneficial uses.
7. Infiltration structural treatment BMPs shall not be used for areas of industrial activity or areas subject to high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (bus, truck, etc); nurseries; and other high threat to water quality land uses and activities as designated by the Permittee.
8. Infiltration structural BMPs shall be located a minimum of 100 feet horizontally from any water supply wells.

G. ALTERNATIVE CERTIFICATION FOR STORM WATER TREATMENT MITIGATION

In lieu of conducting a detailed BMP review to verify Structural or Treatment Control BMP adequacy, a Permittee may elect to accept a signed certification from a Civil Engineer or a Licensed Architect registered in the State of California, that the plan meets the criteria established herein. However, the Permittee remains responsible for compliance with the permit. Accordingly, the Permittee is encouraged to verify that certifying person(s) have been trained on BMP design for water quality, not more than two years prior to the signature date. Training conducted by an organization with storm water BMP design expertise (e.g., a University, American Society of Civil Engineers, American Society of Landscape Architects, American Public Works Association, or the California Water Environment Association) may be considered qualifying.

14. RESOURCES AND REFERENCE

TABLE 1

SUGGESTED RESOURCES

HOW TO GET A COPY

Start at the Source (1999) by Bay Area Stormwater Management Agencies Association

Bay Area Stormwater Management Agencies Association
2101 Webster Street
Suite 500
Oakland, CA
510-286-1255

Detailed discussion of permeable pavements and alternative driveway designs presented.

Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler

Center for Watershed Protection
8391 Main Street
Ellicott City, MD 21043
410-461-8323

Presents detailed engineering guidance on ten different storm water-filtering systems.

Better Site Design: A Handbook for Changing Development Rules in Your Community (1998)

Center for Watershed Protection
8391 Main Street
Ellicott City, MD 21043
410-461-8323

Presents guidance for different model development alternatives.

Design Manual for Use of Bioretention in Stormwater Management (1993)

Prince George's County
Watershed Protection Branch
9400 Peppercorn Place, Suite 600
Landover, MD 20785

Presents guidance for designing bioretention facilities.

Operation, Maintenance and Management of Stormwater Management (1997)

Watershed Management Institute, Inc.
410 White Oak Drive
Crawfordville, FL 32327
850-926-5310

Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.

California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial

Los Angeles County Department of Public Works
Cashiers Office
900 S. Fremont Avenue
Alhambra, CA 91803
626-458-6959

Presents a description of a large variety of Structural BMPs, Treatment Control, BMPs and Source Control BMPs

Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People

Tree People
12601 Mullholland Drive
Beverly Hills, CA 90210
818-753-4600 (?)

Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.

TABLE 1 (Continued)

SUGGESTED RESOURCES	HOW TO GET A COPY
<i>Florida Development Manual: A Guide to Sound Land and Water Management</i> (1988) Presents detailed guidance for designing BMPs	Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472
<i>Stormwater Management in Washington State</i> (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
<i>Maryland Stormwater Design Manual</i> (1999) Presents guidance for designing storm water BMPs	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
<i>Texas Nonpoint Source Book – Online Module</i> (1998) www.txnpsbook.org Presents BMP design and guidance information on-line	Texas Statewide Storm Water Quality Task Force North Central Texas Council of Governments 616 Six Flags Drive Arlington, TX 76005 817-695-9150
<i>Urban Storm Drainage, Criteria Manual – Volume 3, Best Management Practices</i> (1999) Presents guidance for designing BMPs	Urban Drainage and Flood Control District 2480 West 26th Avenue, Suite 156-B Denver, CO 80211 303-455-6277
<i>Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters</i> (1993) Report No. EPA-840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847
<i>National Stormwater Best Management Practices (BMP) Database, Version 1.0</i> Provides data on performance and evaluation of storm water BMPs	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 703-296-6000
<i>Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks)</i> (1998) Presents guidance for design of storm water BMPs	Presents guidance for design of storm water BMPs California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975

TABLE 2

EXAMPLE BEST MANAGEMENT PRACTICES (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff to the storm water conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.
- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.
- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.
- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).
- Use open space development that incorporates smaller lot sizes.
- Reduce building density.
- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the storm water conveyance system.
- Vegetated swales and strips
- Extended/dry detention basins
- Infiltration basin
- Infiltration trenches
- Wet ponds
- Constructed wetlands
- Oil/Water separators
- Catch basin inserts
- Continuous flow deflection/ separation systems
- Storm drain inserts
- Media filtration
- Bioretention facility
- Dry-wells
- Cisterns
- Foundation planting
- Catch basin screens
- Normal flow storage/ separation systems
- Clarifiers
- Filtration systems
- Primary waste water treatment systems

Definition of Terms

1. **Authorized Non-Storm Water Discharges** – Authorized non-storm water discharges are certain categories of discharges that are not composed of storm water but are not found to pose a threat to water quality. They include: water line flushing; landscape irrigation; diverted stream flows; rising ground waters; uncontaminated ground water infiltration (as defined at 40 CFR §35.2005(20)) to separate storm sewers; uncontaminated pumped ground water; discharges from potable water sources; foundation drains; air conditioning condensate; irrigation water that is not reclaimed treated wastewater; springs; water from crawl space pumps; footing drains; lawn watering that is not reclaimed treated wastewater; individual residential car washing; flows from riparian habitats and wetlands; dechlorinated swimming pool discharges; and discharges or flows from emergency fire fighting activities. If any of the above authorized non-storm water discharges (except flows from fire fighting activities) are found to cause or contribute to an exceedance of water quality standards or cause or threaten to cause a condition of nuisance or pollution, the category of discharge must be prohibited.
2. **Best Management Practices (BMPs)** – Best management practices means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of ‘waters of the United States.’ BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. (40 CFR §122.2)
3. **Design Standards** – Design Standards are post-construction requirements to incorporate specific structural best management practices into construction projects. Design standards include, but are not limited to, such things as specifying an amount of runoff that must be retained on a site, and prohibiting the direct connection of truck wells in loading docks to the storm drain system.
4. **Maximum Extent Practicable (MEP)** - MEP is the acronym for Maximum Extent Practicable. MEP is the technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) that municipal dischargers of storm water must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve. MEP is generally a result of emphasizing pollution prevention and source control best management practices (BMPs) primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). The MEP approach is an ever-evolving, flexible and advancing concept, which considers technical and economic feasibility. As knowledge about controlling urban runoff continues to evolve, so does that which constitutes MEP. The way in which MEP is met varies between communities. The individual and collective activities elucidated in their Storm Water Management Program becomes their proposal for reducing or eliminating pollutants in storm water to the MEP.
5. **Measurable Goal** – Measurable goals or Performance Standards, are definable tasks or accomplishments that are associated with implementing best management practices.
6. **Minimum Control Measure** – A minimum control measure is a storm water program area that must be addressed (best management practices implemented to accomplish the program goal) by all regulated Small MS4s. The following six minimum control measures are required to be addressed by the regulated Small MS4s: Public Education and Outreach on storm Water Impacts, Public Involvement/Participation, Illicit Discharge Detection and Elimination, construction Site

Storm Water Runoff Control, Post-Construction Storm Water Management in New Development and Redevelopment, and Pollution Prevention/Good Housekeeping for Municipal Operations.

7. **Offsite Facility** - An offsite facility is a geographically non-adjacent or discontinuous site that is a result of, or secondary to the primary facility, that is, if the primary facility did not exist, neither would the offsite facility. An offsite facility may be included in the permit area of the primary facility and only one NOI must be submitted. The SWMP of the primary facility must clearly state that the offsite facility exists and describe necessary BMPs to be implemented at the offsite facility.
8. **Outfall** - 40 CFR §122.26(b)(9) defined outfall as a point source at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.
9. **Point Source** - 40 CFR §122.2 defines point source as any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.
10. **Performance Standards** - Performance Standards are the level of implementation necessary to demonstrate the control of pollutants in storm water to MEP
11. **Regulated Small MS4** - A regulated Small MS4 is a Small MS4 that is required to be permitted for discharging storm water through its MS4 to waters of the U.S. and is designated either automatically by the U.S. EPA because it is located within an urbanized area, or designated by the SWRCB or RWQCB.
12. **Small Municipal Separate Storm Sewer System (Small MS4)** - Means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that are:
 - (i) Owned or operated by the United States, a State, city, town, boroughs, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States.
 - (ii) Not defined as "large" or "medium" municipal separate storm sewer systems
 - (iii) This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.
13. **Separate Implementing Entity (SIE)** - A Separate Implementing Entity is an entity, such as a municipality, agency, or special district, other than the entity in question, that implements parts or all of a storm water program for a Permittee. The SIE may also be permitted under 40 CFR Part

122. Arrangements of one entity implementing a program for another entity is subject for approval by the Regional Water Quality Control Board Executive Officer, or designee.

14. **Significant Redevelopment** - Significant Redevelopment means land-disturbing activity that results in the creation or addition or replacement of 5,000 square feet or more of impervious surface area on an already developed site. Where Redevelopment results in an alteration to more than fifty percent of impervious surfaces of a previously existing development, and the existing development was not subject to post development storm water quality control requirements, the entire project must be mitigated. Where Redevelopment results in an alteration to less than fifty percent of impervious surfaces of a previously existing development, and the existing development was not subject to post development storm water quality Design Standards, only the alteration must be mitigated, and not the entire development. Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of facility or emergency redevelopment activity required to protect public health and safety. Existing single-family structures are exempt from the Redevelopment requirements.
15. **Waters of the State** – Waters of the state is defined at §13050(e) of the Porter-Cologne Water Quality control Act as any surface water or groundwater, including saline waters, within the boundaries of the state.

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NPDES Phase II Implementation

National Pollutant Discharge Elimination System

A requirement of the
EPA and the Clean
Water Act



NPDES Phase II Implementation requires the establishment of programs that include all of the following Minimum Control Measures (MCM):

- Public Education and Outreach
- Public Participation & Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Storm Water Runoff Control
- Post-Construction Storm Water Management
- Pollution Prevention/Good Housekeeping

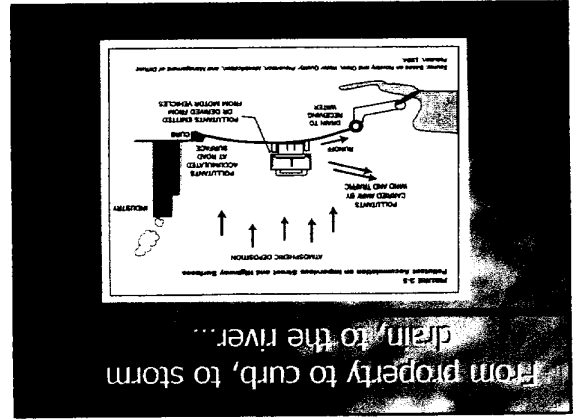
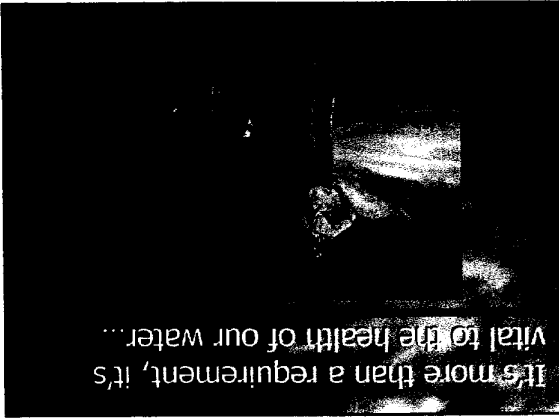
SWMP Schedule of Events:

- Public Workshop today, July 29, 2002
- City Council Shirtsleeve Workshop July 30, 2002
- Prepare Storm Water Management Plan and Estimated Implementation Cost
- City Council Approval October 8, 2002
- Prepare Notice of Intent (NOI) and Related Forms November 2002
- Permit Application Due Date March 2003

Why have we asked you to attend?



➤ Because it affects the way you work and do business in the City of Lodi.



What runs along the curb, goes
into the storm drains...



This goes into...



...the gutter like this...



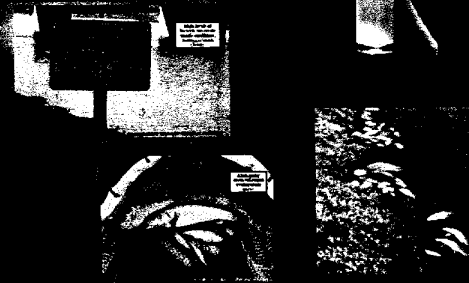
and picks up pollution on the
way, and...



...can unfortunately end up like this.



This is what can happen afterwards...



During construction, vegetation is cleared. With trees and top soil removed, soils are susceptible to erosion.



Without proper control measures, sediment from the site can run off and fill storm drains, impede the flow in the storm system, and choke nearby streams and suffocate fish.

Preventing soil erosion from entering the storm system during construction is essential for protecting streams.



Maximum Extent Practicable (MEP)

- ✓ Technology Based Standard Set by Congress.
- ✓ Pollution Prevention and Source Control BMP's are First Tier MEP's
- ✓ Evolving, Flexible, and Advanced Concept.
- ✓ Technical and Economic Feasibility.

Illicit Discharge Detection & Elimination

- ✓ Locate Priority Problem Areas.
- ✓ Tracing Sources of Illicit Discharges.
- ✓ Removal of Sources.

How is this going to affect the way you do business in the City of Lodi?

- ✓ Elimination of Illicit Discharges.
- ✓ Project Design
- ✓ Erosion Control Plans.
- ✓ Increased Inspection and Public Scrutiny.
- ✓ City Enforcement Mandated by State.
- ✓ Potential for Fines.
- ✓ Incentives for Compliance.

Best Management Practices (BMP's)

- ✓ Tailored to each MCM and community.
- ✓ Measurable goals for each BMP.
- ✓ Time table for implementation

Construction Site Storm Water Run Off

The City of Lodi will have to:

- Develop a program to reduce pollutants from construction activities that disturb > 1 acre.
- Use an ordinance, or other regulatory means, with penalties, that requires appropriate erosion and sediment controls.
- Have procedures for site plan review, inspection, enforcement, and public input.

What You Can Do to Help

Utilize Best Management Practices
when designing new developments

Comply with State and City Storm
water requirements

Stay up to date and active with Storm
water issues

Ask questions and offer suggestions to
improve quality of relationship between
design, development, implementation,
the City and storm water.

Questions??

Thank you for your time.



Description:

The management of storm water runoff from sites after the construction phase is vital to controlling the impacts of development on urban water quality. The increase in impervious surfaces such as rooftops, roads, parking lots, and sidewalks due to land development can have a detrimental effect on aquatic systems. Heightened levels of impervious cover have been associated with stream warming and loss of aquatic biodiversity in urban areas. Runoff from impervious areas can also contain a variety of pollutants that are detrimental to water quality, including sediment, nutrients, road salts, heavy metals, pathogenic bacteria, and petroleum hydrocarbons. An ordinance promotes the public welfare by guiding, regulating, and controlling the design, construction, use, and maintenance of any development or other activity that disturbs or breaks the topsoil or results in the movement of earth on land. The goal of a storm water management ordinance for postconstruction runoff is to limit surface runoff volumes and reduce water runoff pollutant loadings.

Ordinance

Benefits:

- ⇒ Minimize the increase in storm water runoff from any development to reduce flooding, siltation, and streambank erosion and to maintain the integrity of stream channels.
- ⇒ Minimize the increase in nonpoint source pollution caused by storm water runoff from development that would otherwise degrade local water quality.
- ⇒ Minimize the total annual volume of surface water runoff that flows from any specific site during and following development so as not to exceed the predevelopment hydrologic regime to the maximum extent practicable.
- ⇒ Reduce storm water runoff rates and volumes, soil erosion, and nonpoint source pollution, wherever possible, through storm water management controls. Ensure that these management controls are properly maintained and pose no threat to public safety.

Limitations:

- ⇒ Site inspections are required for a postconstruction storm water ordinance to be effective.

An adequate staff must be available to review permit applications and proposed plans.

Siting and Design Considerations:

The purpose of the postconstruction ordinance is to establish storm water management requirements and controls to protect and safeguard the general health, safety, and welfare of the public residing in watersheds within a jurisdiction. The following paragraphs provide the general language and concepts that can be included in the ordinance.

⇒ General Provisions

This section should identify the purpose, objectives, and applicability of the ordinance. The size of the development to which postconstruction runoff controls apply varies, but many communities opt for a size limit of 5,000 square feet or more. This section can also contain a discussion of the development of a storm water design manual. This manual can include a list of acceptable storm water treatment practices and may include the specific design criteria for each storm water practice. In addition, local communities should select the minimum water quality performance standards they will require for storm water treatment practices, and place them in the design manual.

⇒ Definitions

It is important to define the terms that will be used throughout the ordinance to assist the reader and prevent misinterpretation.

Ordinance (continued)

⇒ *Permit Procedures and Requirements*

This section should identify the permit required; the application requirements, procedures, and fees; and the permit duration. The intent of the permit should ensure that no activities that disturb the land are issued permits prior to review and approval. Communities may elect to issue a storm water management permit separate from any other land development permits required, or, as in this ordinance, to tie the issuing of construction permits to the approval of a final storm water management plan.

⇒ *Waivers to Storm Water Management Requirements*

This section should discuss the process for requesting a waiver and to whom this waiver would be applicable. Alternatives such as fees or other provisions for requesting a waiver should be addressed.

⇒ *General Performance Criteria for Storm Water Management*

The performance criteria that must be met should be discussed in this section. The performance criteria can include the following:

- All sites must establish storm water practices to control the peak flow rates of storm water discharge associated with specified design storms and reduce the generation of storm water.
- New development may not discharge untreated storm water directly into a jurisdictional wetland or local waterbody without adequate treatment.
- Annual groundwater recharge rates must be maintained by promoting infiltration through the use of structural and non-structural methods.
- For new development, structural sewage treatment plants must be designed to remove a certain percentage of the average annual postdevelopment total suspended solids (TSS) load.

⇒ *Basic Storm Water Management Design Criteria*

Rather than place specific storm water design criteria into an ordinance, it is often preferable to fully detail these requirements into a storm water design manual. This approach allows specific design information to be changed over time as new information or techniques become available without requiring the formal process needed to change ordinance language. The ordinance can then require those submitting any development application to consult the current storm water design manual for the exact design criteria for the storm water management practices appropriate for their site. Topics in the manual can include minimum control requirements, site design feasibility, conveyance issues, pretreatment requirements, and maintenance agreements.

⇒ *Requirements for Storm Water Management Plan Approval*

The requirements for a storm water management plan to be approved should be addressed in this section. This can be accomplished by including a submittal checklist in the storm water design manual. A checklist is particularly beneficial because changes in submittal requirements can be made as needed without needing to revisit and later revise the original ordinance.

⇒ *Construction Inspection*

This section should include information on the notice of construction commencement, as-built plans, and landscaping and stabilization requirements.

⇒ *Maintenance and Repair of Storm Water Facilities*

Maintenance agreements, failure to maintain practices, maintenance covenants, right-of-entry for inspection, and records of installation and maintenance activities should be addressed in this section.

⇒ *Enforcement and Penalties*

This section should include information regarding violations, notices of violation, stop work orders, and civil and criminal penalties.

Maintenance:

The operation and maintenance language in a storm water ordinance can ensure that designs facilitate easy maintenance and that regular maintenance activities are completed. In the "Maintenance and Repair of Storm Water Facilities" section of the ordinance, it is important to include language regarding a maintenance agreement, failure to maintain practices, maintenance covenants, right-of-entry for inspection, and records of installation and maintenance activities.

Applicability:

These ordinances are applicable to all major subdivisions in a municipality. The size of the development to which postconstruction storm water management runoff control applies varies, but many communities opt for a size limit of 5,000 square feet or more. Applicability should be addressed in more detail in the ordinance itself. It is important to note that all plans must be reviewed by local environmental protection officials to ensure that established water quality standards will be maintained during and after development of the site and that postconstruction runoff levels are consistent with any local and regional watershed plans.

⇒ Several resources are available to assist in developing an ordinance. EPA's 2000 postconstruction model ordinance web site (<http://www.epa.gov/nps/ordinance/postcons.htm>) provides a model ordinance and examples of programs currently being implemented. In addition, the Stormwater Managers Resource Center (<http://www.stormwatercenter.net>), which was created by the Center for Watershed Protection and sponsored by the U.S. Environmental Protection Agency, provides information to storm water management program managers in Phase II communities to assist in meeting the requirements of the National Pollutant Discharge Elimination System Phase II regulations.



Source: EPA website, Office of Water, National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>





Methods for Floatable Debris Control

Source Control:

- ⇒ The obvious first step in source control is to prevent trash from entering the drains to become floatable debris. This prevention measure requires public education about the stormwater drainage system. To further encourage proper disposal, additional trash cans may be installed in public areas to provide additional places of disposal other than the stormwater drains.
- ⇒ Bar screens and other filter type devices installed at the entrance and exit of the stormwater drain prevent some debris from continuing to the outfall. For example, the FloGard+PLUS (manufactured by KriStar Enterprises) fits in storm drains to capture sediment, debris, trash, oils and grease. This device can accommodate low, high, and sustained high flows while continuing to retain collected pollutants.
- ⇒ Consider installing pipe outlet covers on pipes at the outlet of sumped catch basins to stop both free-oil and floatable debris. An example is the SNOUT Stormwater Quality Improvement System (manufactured by Best Management Products, Inc.) that consists of a plastic hood that covers the outlet of the pipe.
- ⇒ Street sweeping, which is developed in another BMP, helps reduce the amount of refuse that ends up in the drainage system.
- ⇒ Encourage community members to recycle yard waste such as grass clippings by leaving them on their lawns instead of dumping.

End-of-Pipe Control: Consider installing...

- ⇒ **Swirl Concentrators.** The flow into the concentrator causes a swirling motion around the removal chamber which encourages sedimentation. Units are typically sized to achieve an average of 80 percent removal of TSS over time. These devices are installed in underground vaults to effectively treat stormwater by removing and retaining sediments and floatables from site runoff. Specific products include V2BI, Vortechs, and Downstream Defender.
- ⇒ **Wet Vaults.** Wet vaults collect and hold floatable debris, bed load material, free oil and grease, settleable sediments and those dissolved pollutants including metals, nitrogen and phosphorous nutrients, and soluble organic compounds. The collected contaminants are retained by the system until they are removed by routine maintenance. Systems like the Jensen or Teichert Interceptor consist of rectangular concrete vaults that are typically multi-chambered with interior chambers separated by baffle walls. Units should be sized based on settling of particles. Other manufacturers such as BaySaver and Stormceptor design round wet vaults. All of these manufacturers produce several models with a range of flow capacities.
- ⇒ **Media Filters.** Media filters are vertical cylinders with a unit capacity of 15 gpm. Multiple cylinders can be used to accommodate the desired system capacity. These cylinders are placed in line, in a vault. Water enters radially through the filter media into an inner cylinder. The filtered water passes downward to an underlain system that is contained in the bottom slab. Media filters can maximize the flow-through rate as each cylinder contains a simple, non-mechanical vacuum device that prevents water from flowing through the cylinder until the water has risen to the top of the cylinder. Primary constituents targeted for removal include dissolved metals and nutrients. Filters can be effective where land is at a premium, but they do require regular maintenance. When filters are undersized or left unmaintained, fine sediment accumulates on their surface and clogs the filter. Stormwater Management markets a filter called a StormFilter.
- ⇒ **Deflection Screens.** Deflection screens are similar to swirl concentrators in that they have a circular removal chamber and flow moves in a circular motion. However, vortex separation is not induced with a deflection screen. Instead removal is accomplished with a screen located around the outer perimeter of the removal chamber. Settleable solids drop at the interface of the screen while the floatables pass upward. The hydraulic action in this device prevents clogging of the screen. CDS (Continuous Deflective Separation) Technologies currently manufactures this device.
- ⇒ **Check Valves.** Consider installing check valves (like the Tideflex manufactured by Red Valve Company, Inc.) to prevent backflow from washing collected floatable debris out of catchments, racks or screens. A check valve must be used in conjunction with a floatable collection system.



Specific Methods for Detecting Illicit Connections

- ⇒ **Dye Testing.** Flushing fluorometric dye into suspicious downspouts can be useful to identify illicit connections. Once the dye has been introduced into the storm system via the connection in question, the water in the collection system is monitored to determine whether an illicit connection is present.
- ⇒ **Visual Inspection.** Remotely guiding television cameras through sewer lines is another way to identify physical connections.
- ⇒ **Smoke Testing.** Smoke testing is another method used to discover illicit connections. Zinc chloride smoke is injected into the sewer line and emerges via vents on connected buildings or through cracks or leaks in the sewer line. Monitoring and recording where the smoke emerges, crews can identify all connections, legal and illegal, to the sewer system. Mechanisms on drains should prevent the smoke from entering buildings; however, in some instances, this will occur. It is important to notify the public that the smoke is non-toxic, though it should be avoided as it can cause irritation of the nose and throat for some people.
- ⇒ **Flow Monitoring.** Monitoring increases in storm sewer flows during dry periods can also lead investigators to sources of infiltration due to improper connections.
- ⇒ **Infrared, Aerial, and Thermal Photography.** Researchers are experimenting with the use of aerial, infrared, and thermal photography to locate dischargers by studying the temperature of the stream water in areas where algae might be concentrated and in soils. It also examines land surface moisture and vegetative growth. This technique assumes that a failing OSDS, for example, would have more moisture in the surface soil, the area would be warmer, and the vegetation would grow faster than in the surrounding area.

Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>





Illicit Discharge

Procedures for Removing the Source of an Illicit Discharge

- ⇒ Issue hefty fines as a penalty to illicit dischargers (if they are identifiable.)
- ⇒ Continue to educate public, local businesses, in addition to identified illicit dischargers about the storm water drainage system. Inform them of the hazards associated with illegal discharges and improper disposal of waste. Provide ways for them to prevent illicit discharges.
- ⇒ Clean up floatable debris using methods found on BMP entitled: "Methods for Floatable Debris Control."

Procedures for Program Evaluation and Assessment

- ⇒ Conduct follow-up field tests periodically to monitor amount of illicit discharge. These tests will reveal whether or not the program has helped improve the storm drain water quality.

The objective of an illicit discharge investigation program is to identify and eliminate the discharge of pollutants to the storm water drainage system. Identifying illicit connections and major sources of floatable debris are key to reducing illicit discharge. Controlling illicit discharge provides important public health benefits as well as lotic ecosystem protection. However, regulating practices like illegal dumping is difficult because of its covert nature.

Procedures for Locating Priority Areas Likely to Have Illicit Discharges

- ⇒ Visually screen outfalls during dry weather.
- ⇒ Conduct field tests of selected pollutants as part of locating priority areas.
- ⇒ Generate a storm sewer system map, showing the location of all outfalls and the names and location of all waters that receive discharges from those outfalls.

Procedures for Tracing the Source of an Illicit Discharge

- ⇒ Again, use the map to locate outfalls where the majority of illicit discharge is found.
- ⇒ Identify illicit connections to the storm drain system. (See BMP entitled "Illicit Connections").
- ⇒ Conduct field tests to evaluate the type of illicit discharge and attempt to link to source. For example, if a great deal of floatable debris displays the same company name, then investigate that company as a potential illicit discharge source. (See BMP entitled "Floatable Debris").



Location of Illicit Discharges: Illicit Connections



Description:

Illicit connections are defined as illegal connections to storm drainage systems. A discharge of industrial wastewater to a storm sewer is "illicit" because it would ordinarily require a permit under the Clean Water Act. Many building owners or operators are not aware that improper connections exist in their facilities. Identifying and removing illicit connections is a measure for reducing storm water pollution. In extreme cases of illicit dumping, legal action is necessary.

Advantages:

- ⇒ Effect method to reduce the quantity of industrial or commercial pollutants that enter the storm drain system.

Disadvantages:

- ⇒ The cost of smoke testing, dye testing, visual inspection, and flow monitoring can be significant and time-consuming.
- ⇒ A local ordinance is necessary to provide investigators with access to private property in order to perform field tests
- ⇒ Rain fall can hamper efforts to monitor flows and visual inspections. In addition, smoke testing and dye testing may become more difficult, depending on the severity of the storm event. Smoke testing has roughly the same efficiency as door-to-door investigation, and both smoke and dye testing are more accurate than visual inspection.

Implementation:

- ⇒ Institute building and plumbing codes to prevent connections of potentially hazardous pollutants to storm drains.
- ⇒ Organize structures to be inspected by building age, with older buildings identified as priorities. Buildings whose processes have the potential to affect water quality also should be given priority.
- ⇒ Map each area to be surveyed and indicate the route of the sewer system and the locations of storm drains on the map. This enables planners to estimate the likely locations of illicit connections. A Geographic Information System (GIS) is an appropriate tool for identifying illicit discharges. The location of illicit discharges can be maintained by a geo-coded address. The attributes for illicit discharges are SIC code, owner/occupant information, inspection schedule, inspection dates, and comments.
- ⇒ Survey individual buildings to discover where connections to storm drains exist.
- ⇒ Inspect sewer lines with television equipment to visually identify all physical connections.
- ⇒ Compare the results of the field tests and the video inspection with the known connections on the map. Suspicious areas should be further investigated.
- ⇒ Institute mandatory inspections for new developments or remodeling to identify illicit connections to the storm sewer system.
- ⇒ Remove and test sediment from the catch basins or equivalent structures.
- ⇒ Inspect connections in question to determine whether they should be connected to the storm drain system or to the sanitary sewer. Use methods of identification such as dye testing, visual inspection, smoke testing, or flow monitoring, as described below.

Maintenance:

- ⇒ Identify illicit discharges with teams of at least two people (volunteers can be used), plus administrative personnel, depending on the complexity of the storm sewer system. Take baseline samples throughout the city so that future illicit discharge pollution identification efforts can be better established.

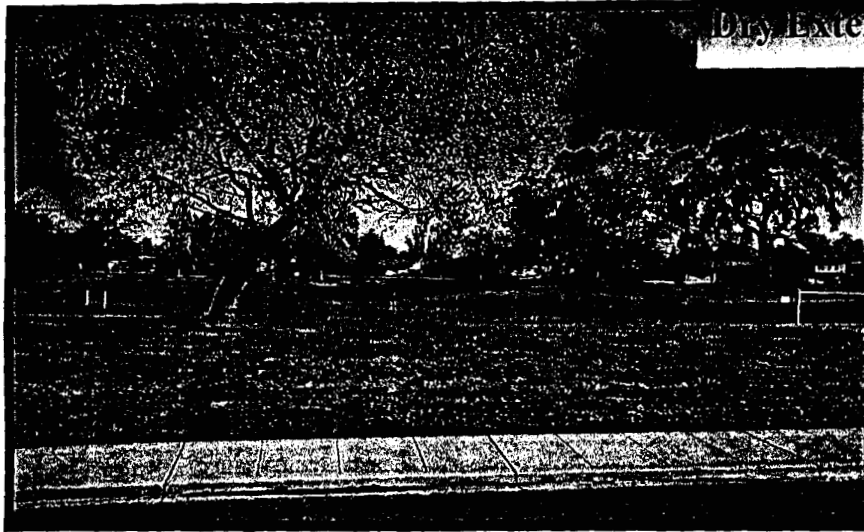
Applications:

Identifying illicit and improper connections are necessary for all sewer systems, especially in areas where pollutants with unknown sources have been detected in receiving waters.



Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>





Dry Extended Detention Pond

Description:

Dry extended detention ponds (a.k.a. dry ponds, extended detention basins, detention ponds, extended detention ponds) are basins whose outlets have been designed to detain the storm water runoff from a water quality design storm for some minimum time (e.g., 24 hours) to allow particles and associated pollutants to settle. Unlike wet ponds, these facilities do not have a large permanent pool. However, they are often designed with small pools at the inlet and outlet of the basin. They can also be used to provide flood control by including additional flood detention storage.

Advantages:

- ⇒ Provides flood control, channel protection, as well as some pollutant removal.
- ⇒ Least expensive storm water management practice (per unit area treated).

Disadvantages:

- ⇒ Have only moderate pollutant removal when compared to other structural storm water practices, and they are ineffective at removing soluble pollutants.
- ⇒ May become a nuisance due to mosquito breeding.
- ⇒ Habitat destruction may occur during construction if the practice is designed in-stream or within the stream buffer.
- ⇒ Although wet ponds can increase property values, dry ponds can actually detract from the value of a home.
- ⇒ Dry extended detention ponds on their own only provide peak flow reduction and do little to control overall runoff volume, which could result in adverse downstream impacts.

Design Criteria:

The design features can be divided into five basic categories: pretreatment, treatment, conveyance, maintenance reduction, and landscaping.

- ⇒ Pretreatment settles out coarse sediment particles from runoff before they reach the large permanent pool. In ponds, pretreatment is achieved with a sediment forebay, which is a small pool (typically about 10 percent of the volume of water to be treated for pollutant removal).
- ⇒ Treatment design features help enhance the ability of a storm water management practice to remove pollutants by designing dry ponds with a high length-to-width ratio (i.e., at least 1.5:1) and incorporating other design features to maximize the flow path to effectively increase the detention time in the system by eliminating the potential of flow to short-circuit the pond. Designing ponds with relatively flat side slopes can also help to lengthen the effective flow path. Finally, the pond should be sized to detain the volume of runoff to be treated between 12 and 48 hours.
- ⇒ Storm water should be conveyed to and from storm water management practices safely in a manner that minimizes erosion potential. The outfall of pond systems should always be stabilized to prevent scour. To convey low flows through the system, designers should provide a pilot channel. A pilot channel is a surface channel that should be used to convey low flows through the pond. In addition, an emergency spillway should be provided to safely convey large flood events. To help mitigate warming at the outlet channel, designers should provide shade around the channel at the pond outlet.
- ⇒ To ease the maintenance burden of each practice, a "micropool" at the outlet can prevent resuspension of sediment and outlet clogging. A good design includes maintenance access to the forebay and micropool. Another design feature that can reduce maintenance needs is a non-clogging outlet. Typical examples include a reverse-slope pipe or a weir outlet with a trash rack. A reverse slope pipe draws from below the permanent pool extending in a reverse angle up to the riser and determines the water elevation of the micropool. Because these outlets draw water from below the level of the permanent pool, they are less likely to be clogged by floating debris.
- ⇒ Designers should maintain a vegetated buffer around the pond and should select plants within the extended detention zone (i.e., the portion of the pond up to the elevation where storm water is detained) that can withstand both wet and dry periods. The side slopes of dry ponds should be relatively flat to increase safety.

Dry Extended Detention Pond (continued)

There are also several variations in design for detention ponds.

- ⇒ Dry detention ponds are similar in design to extended detention ponds. However, they do not incorporate features to improve water quality. In particular, these practices do not detain storm water from small flow events.
- ⇒ Another variation of the dry detention pond design is the use of tank storage. In this design, storm water runoff is conveyed to large storage tanks or vaults underground. This practice is most often used in the ultra-urban environment, on small sites where no other opportunity is available to provide flood control. Tank storage is provided on small areas because providing underground storage for a large drainage area would generally be cost-prohibitive. Because the drainage area contributing to tank storage is typically small, the outlet diameter needed to reduce the flow from very small storms would be very small. A very small outlet diameter, along with the underground location of the tanks, creates the potential for debris to be caught in the outlet and could result in maintenance problems. Since it is necessary to control small runoff events (such as the runoff from a 1-inch storm) to improve water quality, it is generally unfeasible to use tank storage for water quality and generally impractical to use it to protect stream channels.
- ⇒ In arid and semi-arid regions, some modifications might be needed to conserve scarce water resources. Any landscaping plans should prescribe drought-tolerant vegetation wherever possible. In addition, the wet forebay can be replaced with an alternative dry pretreatment, such as a detention cell. One opportunity in regions with a distinct wet and dry season, as in many arid regions, is the use of regional extended detention ponds as a recreation area, such as a ball field during the dry season.

Maintenance:

- ⇒ Semi-annually note erosion of pond banks or bottom.
- ⇒ Annually inspect for damage to the embankment.
- ⇒ Annually monitor for sediment accumulation in the facility and forebay. Examine to ensure that inlet and outlet devices are free of debris and are operational.
- ⇒ Repair undercut or eroded areas, mow side slopes, manage pesticide and nutrients, and remove litter and debris as standard maintenance.
- ⇒ Annually seed or sod to restore dead or damaged ground cover.
- ⇒ Remove sediment from the forebay every 5 to 7 years.
- ⇒ Monitor sediment accumulations and remove sediment when the pond volume has been reduced by 25 percent (every 25 to 50 years).

Applications:

Dry extended detention ponds are among the most widely applicable storm water management practices. Although they have limited applicability in highly urbanized settings, they have few restrictions.

- ⇒ Dry extended detention ponds can be applied in all regions of the United States. Some minor design modifications might be needed, however, in cold or arid climates or in regions with karst (i.e. limestone) topography.
- ⇒ Ultra-urban areas, where little pervious surface is present, it is difficult to use dry extended detention ponds in the ultra-urban environment because of the land area each pond consumes. They can, however, be used in an ultra-urban environment if a relatively large area is available downstream of the pond.
- ⇒ Storm water hot spots are areas where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in storm water. Dry extended detention ponds can accept runoff from storm water hot spots, but they need significant separation from ground water if they will be used for this purpose.
- ⇒ A storm water retrofit is a storm water management practice (usually structural) put into place after development has occurred to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Dry extended detention ponds are very useful storm water retrofits, and they have two primary applications as a retrofit design. In many communities, detention basins have been designed for flood control. It is possible to modify these facilities to incorporate features that encourage water quality control and/or channel protection. It is also possible to construct new dry ponds in open areas of a watershed to capture existing drainage.
- ⇒ Overall, dry extended detention ponds increased temperature by about 5°F. In cold water streams, dry ponds should be designed to detain storm water for a relatively short time (i.e., less than 12 hours) to minimize the amount of warming that occurs in the practice.





Urban Forestry

Description:

Urban forestry is the practice of establishing and maintaining trees and forests in and around towns and cities. Since trees absorb water, patches of forest and the trees that line streets can help provide some of the storm water management required in an urban setting. Urban forests also help break up a landscape of impervious cover, provide small but essential green spaces, and link walkways and trails.

Successful urban forestry requires a conservation plan for individual trees as well as forest areas larger than 10,000 feet². A local forest or tree ordinance is one technique for achieving conservation, and when specific measures to protect and manage these areas are included, urban forests and trees can also help reduce storm water management needs in urban areas.

Advantages:

- ⇒ Trees absorb carbon dioxide, reduce temperature, and provide habitat for urban wildlife.
- ⇒ Urban forests can act as natural storm water management areas by filtering particulate matter (pollutants, nutrients, and sediment) and by absorbing water.
- ⇒ Reduction of noise levels and increased recreation benefits and property values.

Disadvantages:

- ⇒ Development pressure often conflicts with urban forestry measures.
- ⇒ The size of the land may limit the ability to protect individual trees.
- ⇒ Forests may harbor undesirable wildlife elements, including insects and other pests. If forests border houses, this may be a concern for residents.



Implementation:

The concept of the Critical Root Zone (CRZ) is essential to a proper management plan. The CRZ is the area required around a tree for the tree's survival. Determined by the tree size and species, as well as soil conditions for isolated specimen trees, the CRZ can be estimated as 1 1/2 feet of radial distance for every inch of tree diameter. In larger areas of trees, the CRZ of forests can be estimated at 1 foot of radial distance for every inch of tree diameter, or a minimum of 8 feet. An urban forestry plan should include measures to establish, conserve, and/or reestablish preservation areas. A forest preservation ordinance is one way to set design standards outlining how a forest should be preserved and managed. The ordinance should outline some basic management techniques and should contain some essential elements. The following is a list of some typical elements of a forest conservation plan:

- A map and narrative description of the forest and the surrounding area that includes topography, soils, streams, current forested and unforest areas, tree lines, critical habitats, and 100-year flood plain.
- An assessment that establishes preservation, reforestation, and afforestation areas.
- A forest conservation map that outlines forest retention areas, reforestation, afforestation, protective devices, limits of disturbance, and stock-pile areas.
- A schedule of any additional construction in and around the forest area.
- A specific management plan, including tree and forest protection measures.
- A reforestation and afforestation plan.

Maintenance:

- ⇒ May require fringe landscaping and trash pick-up. By using native vegetation and keeping the area as natural as possible, maintenance can be minimized.

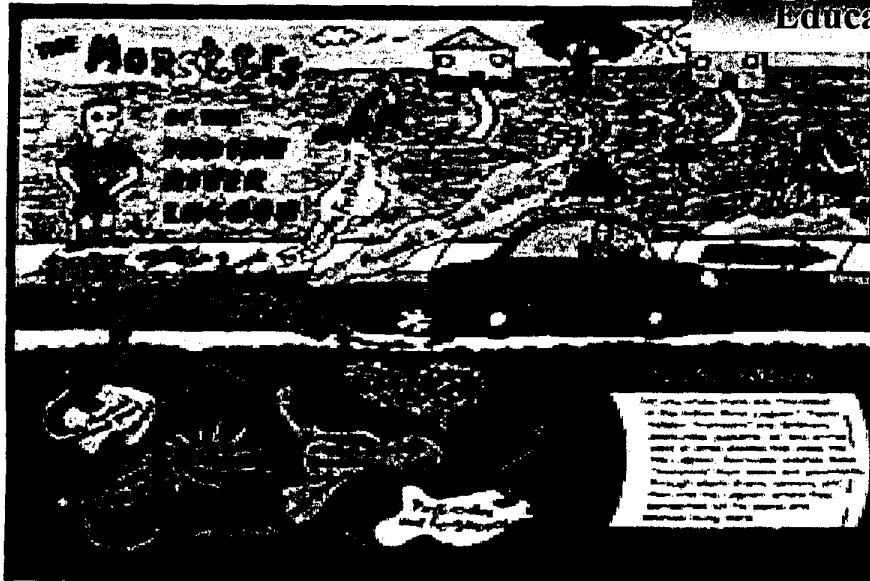
Applications:

- ⇒ From a stream preservation perspective, it is ideal to retain as much contiguous forest as possible. At the same time, this may not be an option in many urban areas. If forested areas are fragmented, it is ideal to retain the closest fragments together.
- ⇒ In rapidly urbanizing areas, where clearing and grading are important, tree preservation areas should be clearly marked. Delineating lines along a CRZ rather than a straight line is essential to preserving trees and can help reduce homeowner complaints about tree root interference into sewer or septic lines.

Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>



Educational Pamphlets



Description:

Printed materials are a common way to inform the public about storm water pollution. Some municipalities have a public relations department or a staff member that handles these outreach materials, whereas others contract with public relations firms and graphic designers to develop materials. Regardless of who actually produces the materials, municipalities should be creative when deciding which media to use and what types of messages are appropriate for those media. Some common printed materials include educational displays, pamphlets, booklets, and utility stuffers.

Advantages:

- ⇒ Can be tailored to many different types of audiences.
- ⇒ A brochure can be written for the general public and later edited so that it reaches individuals within the storm water industry.
- ⇒ Relatively inexpensive and can reach large groups of people, especially when displayed in public places (e.g., public libraries).

Disadvantages:

- ⇒ Care must be taken to ensure that the message is easily understood by the targeted audience.

Implementation:

- ⇒ Pamphlets, booklets, and brochures are an effective way to present and explain a storm water message. Unlike many other communication vehicles, pamphlets and booklets can be distributed in many places without requiring someone to staff them. Racks of pamphlets can be set up at libraries, schools, offices, and fairs. They can be passed out at meetings and used in a direct mail campaign. Before creating a pamphlet or booklet, it is important to think through the purpose of the piece and its intended audience. It might be intended to solicit interest in a specific storm water event or activity, or to promote storm water education and positive behaviors. The purpose will significantly define the appearance and content.
- ⇒ In addition to a booklet or pamphlet, a one-page flyer can be produced to carry the basic message. A short, to-the-point flyer is essential as the primary education tool for programs with a small budget. Commonly, flyers list the basic do's and don'ts of water pollution and list the top 10 actions the public should take against storm water pollution. The flyer should contain the basic list of information the public needs to know. The flyer should be designed to be easily reproduced for newspapers and newsletters (black-and-white and reproducible by copy machine), a major venue for communicating with the public. The flyer can be designed as a self-mailer and as funds become available, it can be expanded into a poster, calendar, or booklet.
- ⇒ As with pamphlets, booklets, and flyers, utility stuffers offer an inexpensive, convenient way to convey the message to a large audience. However, instead of being targeted at a specific audience, utility stuffers must be appropriate for the public. These inserts can be extremely effective if they are engaging, concise, and memorable. They are often used to impart brief, important messages, provide overviews of the problems and solutions, or implore simple actions. When designing the insert, explore options regarding paper and ink colors, type faces, and type sizes; the text should be kept brief, the letters fairly large, and the design attractive. Special care should be taken to ensure that the message is simple, concisely written, and tells the reader why this issue is important to them.

Applications:

Educational displays, pamphlets, booklets, and stuffers can be easily exhibited and distributed to a large population. They can be made using simple materials and graphics, or they can be made more elaborate. Furthermore, these displays can be made for any and all age levels, in any language, or for specific audiences.

Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>



Classroom Education



Description:

Classroom education is an integral part of any storm water pollution outreach program. Providing storm water education through schools exposes the message not only to students but to their parents as well. Many municipal storm water programs have partnered with educators and experts to develop storm water-related curricula for the classroom. In addition to formal lessons, activities such as poster contests can be initiated in the classrooms.

Advantages:

- ⇒ Children will learn about environmental issues early and will therefore become interested and perhaps involved at earlier ages.
- ⇒ Schoolchildren often tell their parents what they learn in school. Therefore, teaching children about storm water is an effective way to pass environmental awareness to their parents and throughout the entire community.
- ⇒ Activities like poster contests can simultaneously educate and inspire creativity.
- ⇒ Poster contest results can be posted in the community to educate adults as well as children.
- ⇒ Lessons need not be elaborate or expensive to be effective.

Disadvantages:

- ⇒ Incorporate storm water issues into the school curricula with so many subjects to teach is difficult as environmental issues might be viewed as less important.
- ⇒ Cost of new materials.
- ⇒ Effective activities must target the correct age group(s).

Implementation:

- ⇒ Building a strong relationship with the school district is the most important step in getting storm water education into the schools. One of the first questions to ask is what storm water education program, if any, do the schools already implement, or want to see in their schools but lack the resources to do so. When developing an outreach message for children, choose the age ranges to target. Will the focus be on students in preschool, grammar school, middle school, and/or high school? Should the curricula be grade-level specific? Will the program involve a year-long study, a semester, a special topic or event, an art or writing contest, or a single presentation by an organization? What special equipment might be needed? For example, the municipality might purchase a small-scale watershed model that can be loaned to schools for demonstrations as part of a watershed education program. The answers to these questions and others will be determined by both the school district's needs and the municipal resources available.
- ⇒ Many national and regional organizations can provide assistance and materials for storm water education. The national Center for Environmental Education (CEE) was established in 1990 to provide teachers with a single clearinghouse for K-12 environmental education materials. CEE has written a guidebook titled *Blueprint for a Green School* to tackle the environmental challenges found inside schools and on school playgrounds. CEE's outreach department works with schools nationwide. One of the most popular programs, *Green School's Peer Partners in Environmental Education*, organizes high school students to adopt an elementary school or class. A free copy of the on-line program is available through Earth Spirit at 310-582-8228. CEE's Internet page at www.cee-ane.org is another good source of information.
- ⇒ If a school requests storm water outreach materials, municipalities can provide educational aids that range from simple photocopied handouts, overheads, posters, and slide shows, to more costly and elaborate endeavors such as working models and displays.

Recommendation:

Implementing a writing or art contest may be an effective way to educate a large number of adults and children. A contest could be initiated with an introductory lesson on storm water programs. Then if students are interested, they could enter the contest. A contest would inspire creativity, rewarding, educating, and fun. Furthermore, post-contest results could be displayed in the local newspaper or libraries, for example, and therefore educate many others. This type of education has the potential to reach all levels in the community through a single effort.

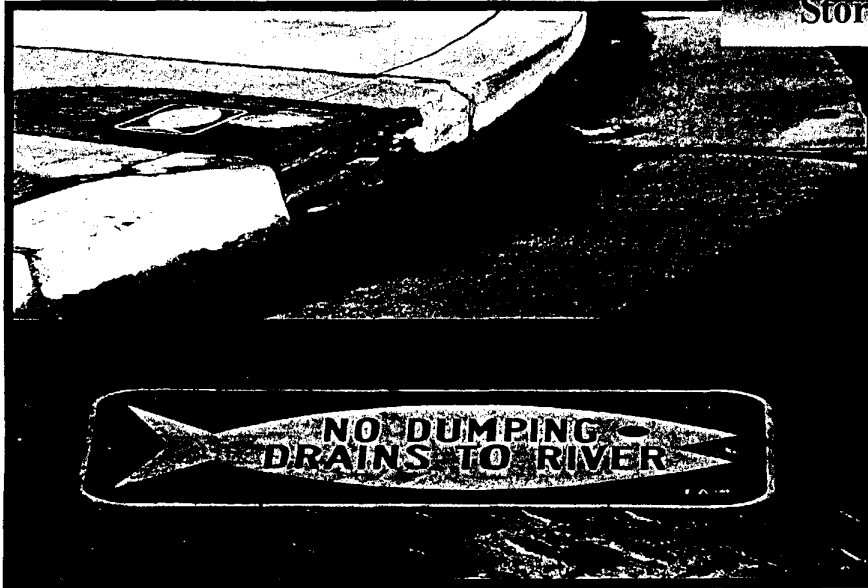
Applications:

Any school that wants to educate students about storm water.

Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>



Storm Drain Stenciling



Description:

Storm drain stenciling involves labeling storm drain inlets with painted messages warning citizens not to dump pollutants into the drains. The stenciled messages are generally a simple phrase to remind a passerby that the storm drains connect to local waterbodies and that dumping pollutes those waters. Some specify which waterbody the inlet drains into or names the particular river, lake, or bay. Commonly stenciled messages include: "No Dumping. Drains to Water Source," "Drains to River," and "You Dump it, You Drink it. No Waste Here." Pictures can also be used to convey the message, including a shrimp, common game fish, or a graphic depiction of the path from drain to waterbody.

Advantages:

- ⇒ Excellent opportunity to educate the public about the link between the storm drain system and drinking water quality.
- ⇒ Generally effective, inexpensive, and easy to implement.

Disadvantages:

- ⇒ Larger communities have many storm drain inlets, so volunteer coordinators need to be skilled at organizing to provide adequate coverage in large areas.
- ⇒ Safety considerations in areas where traffic congestion is high.
- ⇒ Environmental considerations from the use of propellants in spray paint.
- ⇒ Requires repainting after years of weather and traffic.
- ⇒ Difficult to precisely measure the effect that storm drain stenciling programs have on human behavior.

Implementation:

Municipalities can implement storm drain stenciling programs in two ways. In some cases, cities and towns use their own public works staff to do the labeling. Some municipalities feel that having their own crews do the work produces better results and eliminates liability and safety concerns. More commonly, stenciling projects are conducted by volunteer groups in cooperation with a municipality. In such an arrangement, volunteer groups provide the labor and the municipality provides supplies, safety equipment, and a map and/or directions to the drains to be stenciled. The benefits of using volunteers are lower cost and increased public awareness of storm water pollutants and their path to waterbodies. A municipality can establish a program to comprehensively address storm drain stenciling and actively recruit volunteer groups to help, or the municipality can facilitate volunteer groups that take the initiative to undertake a stenciling project.

- ⇒ Whether the municipality or a volunteer group initiates a stenciling project, the municipality should designate a person in charge of the storm drain stenciling program. Many municipalities will designate a person from the public works or water quality department to coordinate stenciling projects by volunteer groups. Because these programs depend heavily on volunteer labor, organizers and coordinators should be skilled in recruiting, training, managing, and recognizing volunteers. Coordination activities include providing:
 - Stenciling kits containing all materials and tools needed to carry out a stenciling project
 - A map of the storm drains to be stenciled
 - Training for volunteers on safety procedures and on the technique for using stencils or affixing signs
 - Safety equipment (traffic cones, safety vests, masks and/or goggles, etc.)
 - Incentives and rewards for volunteers (badges, T-shirts, certificates).
- ⇒ Most communities use stencils and paint to label their storm drains. Some communities stencil directly onto the curb, street, or sidewalk, while others first paint a white background and then stencil over it. The most commonly used stencils are made of Mylar, a flexible plastic material that can be cleaned and reused many times. However, stencils can also be made from cardboard, aluminum, or other material.
- ⇒ Drains should be carefully selected to send the message to the maximum number of citizens and to target drains leading to waterbodies where illegal dumping has been identified.

Applications:

- ⇒ Entire community, especially in areas with sensitive waters or where trash, nutrients, or biological oxygen demand have been identified as high priority pollutants. Areas where littering, nutrient overenrichment, and other practices that contribute to non-point source pollution is a problem.

Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdcs/menuofbmps/menu.htm>



Community Hotline



Description:

Because regulators and authorities cannot monitor all waterbodies at once, they sometimes rely on the public to keep them informed of water polluters. Community hotlines provide a means for concerned citizens and agencies to contact the appropriate authority when they see water quality problems. A hotline can be a toll-free telephone number or an electronic form linked directly to a utility or government agency, such as the water quality control board. A typical call might report a leaking automobile, concrete wash-out dumped on the street, paint in a creek, or organic debris (including pet waste) in a drainage system or waterway.

Advantages:

- ⇒ Link between the citizens and the municipality's government. It can be an avenue for citizens to feel more involved in their community.
- ⇒ Can catch illegal polluters or stop spills that might otherwise go unnoticed.

Disadvantages:

- ⇒ Community must be able to pay for hotline and keep the hotline staffed.
- ⇒ Hotline must be advertised in order for the effort to be successful.

Effectiveness:

A storm water hotline is effective when its number is easily remembered (i.e., has a catchy name) or is easily accessible. Most important, however, is the responsiveness of the hotline. If a citizen reports an illegal dumping but no action is taken by the appropriate authority, that citizen could lose faith in the hotline and might not call back with future information.

Implementation:

A municipality must first determine whether they need a hotline and, if so, whether the hotline is needed immediately or in the near future. A city can identify their need for a hotline by addressing the following questions:

- Does the city receive frequent phone calls for information about water bodies and stream pollution?
- Are there frequent complaints?
- Are there any anticipated construction or other projects in the city?
- Are there any new ordinances or regulations?
- Does the city currently use a "hit or miss approach," in which whoever picks up the phone deals with the situation?

Once a city has determined that they need a hotline, they should choose between a telephone or an e-mail hotline.

- ⇒ To establish a storm water pollution hotline, a party or agency responsible for maintaining the hotline and responding to incoming complaints must first be identified. The responsible party could be a division of local government, a water quality board, a public utility, or an environmental agency. If the city chooses to use its own staff, it should keep in mind that the staff will require training. The city could also contract with a professional hotline provider. Once the party has agreed to maintain the hotline, it will need to establish a telephone number (preferably toll-free and to be used solely to report pollution complaints) and/or Internet site to receive notification.
- ⇒ All distributed materials should include pollution hotline numbers and information. Typically, hotlines are advertised on public education materials concerned with water quality, such as flyers, door hangers, and brochures. The hotline could also be publicized on "permanent" materials such as bumper stickers and refrigerator magnets, where the number can be retained and easily located.
- ⇒ Hotline costs can be minimized by staying a step ahead of questions and by developing close liaison with city staff to anticipate information needs. Cost estimates can be obtained by comparing the costs of training city staff and using a professional hotline service.

Applicability:

Generally, an investigation team promptly responds to a hotline call and, in most cases, visits the problem site. If a responsible party can be identified, the team informs the party of the problem, offers alternatives for future disposal, and instructs the party to resolve the problem. If the issue is not resolved by the responsible party (or the party cannot be identified), the proper authority takes action to remediate the situation and prevent future violations.

Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>





Adopt-a-Stream Programs

Description:

Adopt-A-Stream programs are an excellent public outreach tool for municipalities to involve citizens of all ages and abilities. They are volunteer programs in which participants "adopt" a stream, creek, or river to study, clean up, monitor, protect, and restore. Through these activities, the adopting group or organization becomes the primary caretaker of that stretch of stream in the watershed.

Advantages:

- ⇒ Participants of the program make areas in the watershed more visually attractive and improve habitat for wildlife, thus saving and restoring natural resources.
- ⇒ In addition, the hands-on activities and recognition and exposure that schools, private organizations, and the community get when participating in an Adopt-A-Stream program provide a tremendous sense of accomplishment.

Disadvantages:

- ⇒ Requires a strong commitment to the program. Many people sign up for activities but quickly find they do not have time for follow-up activities. This is one reason youth groups are so well suited for these projects. By integrating a stream program into a curriculum or into a yearly scout project, the group's commitment is ensured.
- ⇒ Funding availability, weather, equipment maintenance, and liability associated with the dangers of slippery rocks or steep slopes.

Implementation

Municipalities can begin an Adopt-A-Stream program by obtaining a watershed map and marking potential stream sites on it. Rough watershed maps can be obtained from EPA's *Surf Your Watershed* web site at <http://www.epa.gov/surf>, or more detailed maps can be ordered from the U.S. Geological Survey at <http://mapping.usgs.gov>. The watershed map can then be used to keep track of which stretches are adopted and by whom. Once the stream sites have been identified, a monitoring and reporting plan to evaluate the conditions on the stream should be developed.

- ⇒ The next step is to prepare "how to" packets on each activity that can be distributed to interested organizations. Typical packets include:
 - Instructions and information needed to conduct an activity such as stream monitoring or storm drain stenciling
 - Topographic maps of the area (with the stream of interest designated)
 - Data sheets for recording observations
 - Equipment or lists of necessary equipment (such as bags, gloves, and monitoring devices)
 - First-aid kits
 - Comments on the stream's history
 - Field guides
 - Contact information
 - A basic "do's and don'ts" list for what to do if hazardous materials like syringes are encountered
 - Safety tips
 - General hints for a successful cleanup
 - Rewards for volunteers (such as stickers or certificates)
- ⇒ A packet for conducting a stream cleanup might include trash bags and gloves, a map designating appropriate trash pickup sites along the stream and private land areas for which special permission might be required, and a list of contact information for trash collectors and recyclers.
- ⇒ Most Adopt-A-Stream programs also require documentation to be completed by their participants. For example, almost all programs call for a registration form to be completed by the group.

Applicability:

Adoptions are as flexible and unique as the streams themselves. Adopting a stream is a great program for youth groups, including church groups, scouts, and school clubs, but it can also be a great activity for adult groups such as neighborhood associations, civic organizations, or businesses.

Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>





Description:

This management measure involves educating the general public, businesses, and municipal fleets (public works, school buses, fire, police, and parks) on the water quality impacts of the outdoor washing of automobiles and how to avoid allowing polluted runoff to enter the storm drain system. Outdoor car washing has the potential to input high loads of nutrients, metals, and hydrocarbons to watersheds during dry weather conditions, as the detergent-rich water used to wash the cars flows into the storm drain. Commercial car wash facilities often recycle their water or are required to treat their wash water discharge prior to release to the sanitary sewer system. Most storm water impacts from car washing are caused by residents, businesses, and charity car wash fundraisers that discharge polluted wash water to the storm drain system. According to the surveys, 55 to 70 percent of households wash their own cars, with the remainder going to a commercial car wash.

Limitations:

- ⇒ Lack of knowledge regarding the impacts of polluted runoff. Many people do not associate the effects of their vehicle washing activities with local water quality and may be unaware that the discharges that enter storm drains are not treated at plants before being discharged into local waters.
- ⇒ Costs. Construction of a specialized area for vehicle washing can be expensive. Also, for facilities that cannot recycle their wash water, pretreating wash water, through either structural practices or planning for collection and hauling of contaminated water to sewage treatment plants, can represent a cost limitation.

Vehicle Washing

Implementation:

The development of a prevention program to reduce the impact of car wash runoff includes outreach on management practices to reduce discharges to storm drains. Some of these management practices include the following:

- Using a commercial car wash.
 - Washing cars on gravel, grass, or other permeable surfaces.
 - Blocking off the storm drain during charity carwash events or using an insert to catch wash water.
 - Directing soapy water from car washes to sanitary sewer drains.
 - If pumping into a drain is not feasible, pumping car wash water onto grass or landscaping to provide filtration.
 - Using hoses with nozzles that automatically turn off when left unattended.
 - Using only biodegradable soaps.
- ⇒ Storm drain stenciling programs emphasizing the connection between the storm drain system and runoff can also help reinforce the idea that car washing activities can affect local water quality.
- ⇒ In the Pacific Northwest, outreach programs provide materials to charity carwash organizers to prevent car wash water from entering storm drains. These "water friendly" carwash kits are provided free of charge to charity organizers, along with training and educational videos on planning an environmentally friendly carwash. Two types of equipment are available for charity organizations to borrow: a catch-basin insert with a sump pump, or a vacuum/boom device known as a Bubble Buster. Both devices capture wash water runoff, allowing it to be pumped to either a sanitary sewer or a vegetated area for treatment.

Effectiveness:

The effectiveness of car washing management practices at reducing nonpoint source pollutant loads has yet to be measured accurately. Due to the diffuse nature of nonpoint source pollution, it is often difficult to determine the exact impact of a particular pollution prevention measure at reducing pollutant loading.

Applicability:

Car washing is a common routine for residents and a popular way for organizations such as scout troops, schools, and sports teams to raise funds. This activity's impact on water quality is greatest in more urbanized areas with higher concentrations of automobiles. Carwash fundraisers are popular in Lodi and are of particular concern for the City.

Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>





Street Cleaning

Description:

This management measure involves employing pavement cleaning practices such as street sweeping on a regular basis to minimize pollutant export to receiving waters. These cleaning practices are designed to remove from road and parking lot surfaces sediment debris and other pollutants that are a potential source of pollution impacting urban waterways. Although performance monitoring for the Nationwide Urban Runoff Program (NURP) indicated that street sweeping was not very effective in reducing pollutant loads, recent improvements in street sweeper technology have enhanced the ability of present day machines to pick up the fine grained sediment particles that carry a substantial portion of the storm water pollutant load. Many of today's sweepers can now significantly reduce the amount of street dirt entering streams and rivers, some by significant amounts. A debate as to whether this ability to pick up finer particles will improve the overall pollutant removal effectiveness of street sweepers is ongoing, and further research is required to establish the optimal sweeping frequency for pollutant removal.

Disadvantages:

- ⇒ The high cost of some of the newer sweeper technologies is approaching \$200,000.
- ⇒ The potential inability to restrict parking in urban areas.
- ⇒ The need for sweeper operator training, the inability of current sweeper technology to remove oil and grease, and the lack of solid evidence regarding the level of pollutant removal.

Design Considerations:

- ⇒ One factor considered most essential to the success of street sweeping as a pollutant removal practice is the use of the most sophisticated sweepers available. Innovations in sweeper technology have improved the performance of these machines at removing finer sediment particles, especially for machines that use vacuum-assisted dry sweeping to remove particulate matter. By using the most sophisticated sweepers in areas with the highest pollutant loads, greater reductions in sediment and accompanied pollutants can be realized.
- ⇒ Another important aspect of street sweeping programs is the ability to regulate parking. The ability to impose parking regulations in densely populated areas and on heavily traveled roads is essential.
- ⇒ The frequency and location of street sweeping is another consideration for any program. How often and what roads to sweep are determined by the program budget and the level of pollutant removal the program wishes to achieve. Computer modeling of pollutant removal in the Pacific Northwest suggests that the optimum sweeping frequency appears to be once every week or two. More frequent sweeping operations yielded only a small increment in additional removal. The model also suggests that a somewhat higher removal rate could be obtained on residential streets as opposed to more heavily traveled arterial roads.
- ⇒ Parking lot sweeping is also employed as a nonstructural management practice for industrial sites. This involves using brooms to remove small quantities of dry chemicals and solids from areas that are exposed to rainfall or storm water runoff. While the effectiveness of this pollutant removal is unknown, the sweeping and proper disposal of materials is a reasonably inexpensive method that requires no special training or equipment.

Maintenance:

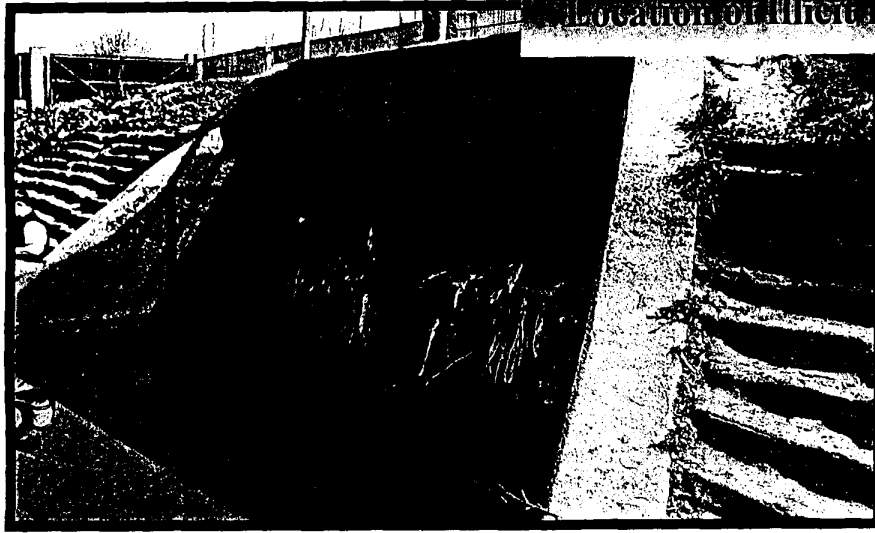
Street cleaning programs require a significant investment of capital and a yearly operation and maintenance budget. Sweepers have a useful life of about four years, and proper maintenance can greatly improve sweeping efficiency. Arrangements for disposal of the swept material collected must also be made, as well as accurate tracking of the streets swept and the frequency of sweeping.

Applicability:

Most urban areas. The frequency and intensity of rainfall for a region is a key variable in determining how streets need to be swept to obtain a desired removal efficiency. Other factors that affect a street sweeper's ability to reduce nonpoint pollution include the condition of the street, its geographical location, the operator's skill, the presence of parked cars, and the amount of impervious area devoted to rooftops.

Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>





Location of Inlet Discharges: Floatable Debris

Description:

Identifying the source of floatable material in stormwater is key to developing a program to control it. By expanding existing programs the City can attempt to track floatable debris to its source.

Clogged drains and storm drain inlets can cause the drains to overflow, leading to increased erosion. Benefits of cleaning include increased dissolved oxygen, reduced levels of bacteria, and support of instream habitat. Areas with relatively flat grades or low flows should be given special attention because they rarely achieve high enough flows to flush themselves.

Advantages:

- ⇒ Improved storm water drainage.
- ⇒ Educates high school students and the community while generating useful information for the program.

Disadvantages:

- ⇒ High cost of program materials and monitoring.
- ⇒ Difficult to control the use of floatable material.
- ⇒ May be difficult to find high schools interested in participating in the program.
- ⇒ Illegal dumping is often spurred by cost and convenience considerations, and a number of factors encourage this practice. The cost of fees for dumping at a proper waste disposal facility are often more than the fine for an illegal dumping offense, thereby discouraging people from complying with the law.

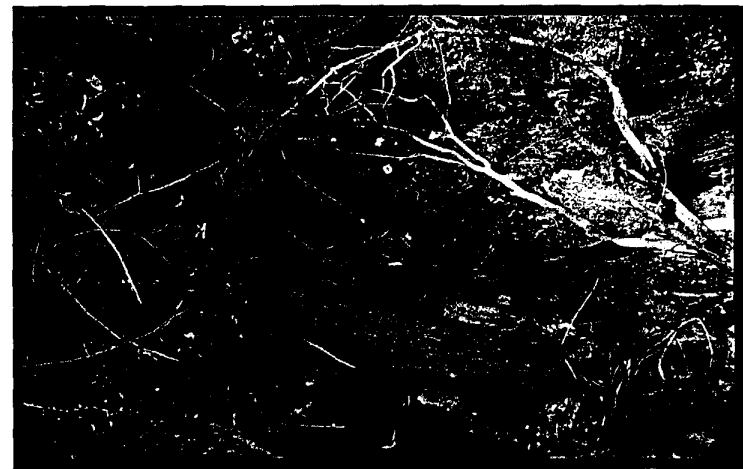


Implementation:

- ⇒ Utilize the Storm Drain Detectives Program in which high school students conduct a floatable debris characterization study to identify specifically what the debris in the stream consists of (i.e., 20% styrofoam cups, 30% fast food wrappers, 10% empty soda cans or bottles, etc.). A drainage system inventory would be conducted to locate the most severe problem (i.e., downstream of parks, schools, fast food restaurants, etc.). This inventory would be based on volume collected during a set period of time.
- ⇒ Evaluate source control strategy options.
- ⇒ Increase frequency of trash collection at specific locations.
- ⇒ Change City codes and ordinances to restrict use of floatable materials if a specific segment of the community can be identified as causing a disproportionate share of the problem.
- ⇒ Modify catch-basin inlet design to include a screen that will prevent floatable debris from entering the piped conveyance system.
- ⇒ Consider end-of-pipe separators (i.e., swirl concentrators).

Applicability:

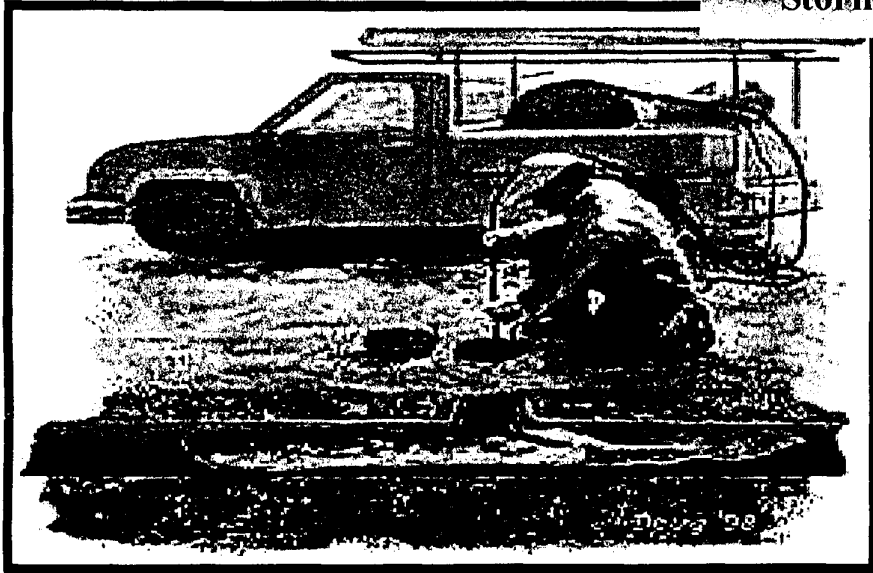
- ⇒ Areas with heavier rainfall, due to the greater volume of runoff.
- ⇒ In more urbanized areas, where illegal dumping may occur due to inaccessibility of recycling or solid waste disposal centers, which are often located on the suburban-rural fringe.



Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>



Storm Drain Cleaning



Description:

Storm drain systems need to be cleaned regularly to maintain their ability to trap sediment, and consequently their ability to prevent flooding. Most drains have catch basins built at the curb line which allow surface water runoff to enter the storm water conveyance system. Many catch basins have a low area below the invert of the outlet pipe intended to catch coarse sediment. By trapping sediment, the catch basin prevents solids from clogging the storm sewer and being washed into receiving waters. Routine cleaning reduces the amount of pollutants, trash, and debris both in the storm drain system and in receiving waters. Clogged drains and storm drain inlets can cause the drains to overflow, leading to increased erosion.

Advantages:

- ⇒ Better drainage will reduce large-scale maintenance and repairs.
- ⇒ Improvement of aesthetics and water quality. Increase of dissolved oxygen, reduction of bacteria levels, reduction of odor, and support of instream habitat.
- ⇒ Efficient and cost-effective method for preventing the transport of sediment and pollutants to receiving water bodies.

Disadvantages:

- ⇒ Removed debris usually contains appreciable amounts of water and offensive organic material which must be properly disposed.
 - ⇒ Difficult to clean in areas with poor accessibility or traffic congestion.
 - ⇒ The efficiency of storm system flushing decreases when the length of sewer line being cleaned exceeds 700 feet.
- A water source is necessary for cleaning.

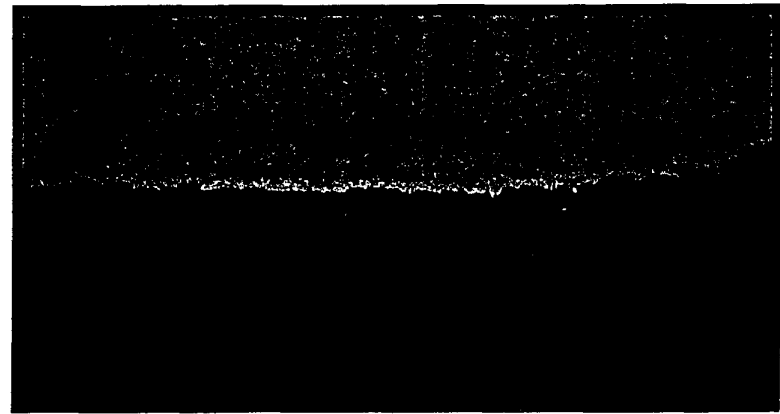
Maintenance:

- ⇒ Must remove 55 to 65 percent of nonorganic materials and grits and 65 to 75 percent of organics.
- ⇒ Catch basins should be inspected at least annually to determine if they need to be cleaned. Typically, a catch basin should be cleaned if the depth of deposits is greater than or equal to one-third the depth from the basin to invert of the lowest pipe or opening into or out of the basin. If a catch basin significantly exceeds the one-third depth standard during the annual inspection, then it should be cleaned more frequently. If woody debris or trash accumulates in the basin, then cleaning should be weekly.
- ⇒ Catch basins can be cleaned manually or with specially designed equipment like bucket loaders and vacuum pumps. Removed material can usually be disposed in conventional landfills. However, before any materials can be disposed, it is necessary to perform a detailed chemical analysis to determine if the materials meet the EPA criteria for hazardous waste.

Applicability:

This measure is applicable to all storm drain systems. The same principles can be applied to material and waste handling areas, paved and vegetated areas, waterways, and new development projects. Areas with relatively flat grades or low flows should be given special attention because they rarely achieve high enough flows to flush themselves. Many programs tend to focus only on removal of debris from grate openings, but a full implementation of this BMP should also include removal of debris from the catch basin itself.

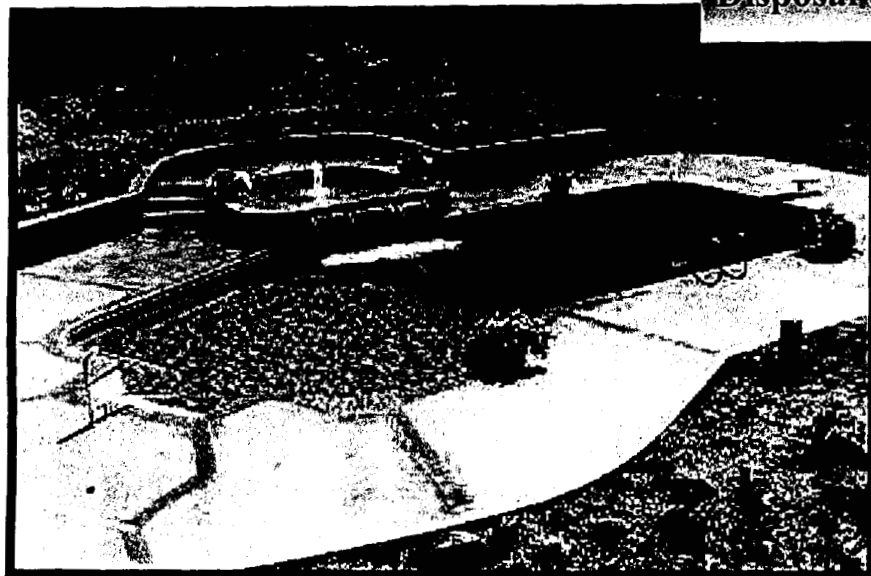
Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm



Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>



Disposal of Chlorinated Water



Description:

Chlorinated water discharged to surface waters has an adverse impact on local water quality. Swimming pools are a major source of chlorinated water discharged into sanitary and storm sewer systems. An average swimming pool holds 19,000 gallons of chlorinated water. Pools have high concentrations of chlorine, which is toxic to wildlife and fish. Proper disposal of chlorinated water can include dechlorination before discharge and/or discharge to the sanitary sewer system or land.

Advantages:

- ⇒ A safe discharge of chlorinated water will improve water quality for fish and wildlife.

Limitations:

- ⇒ Enforcement of safe discharge of chlorinated water may be difficult to achieve.

Implementation:

- ⇒ Requires pool owners to obtain permission from local sanitary sewer operators or municipal treatment plant operators to discharge to the sanitary sewer system using a surge tank.
- ⇒ Discharge the chlorinated water to land where it will not drain to local surface waters.
- ⇒ Dechlorinate the water before draining the pool.
- ⇒ Require residential pools to discharge backwash water to the sanitary sewer.
- ⇒ If the only option for draining pool water is to discharge directly into the environment, water quality must comply with the applicable water quality criteria.
- ⇒ Pool water must sit for at least 2 days after the addition of chlorine or bromine or until chlorine or bromine levels are below 0.1 mg/l.
- ⇒ The pH of discharged water must be between 6.5 and 8.5 before it is discharged.
- ⇒ Algicides such as copper or silver can interrupt normal algal and plant growth and should not be used.
- ⇒ Total suspended solids must be below 60 mg/l—suspended particles should be allowed to settle out and the water should not appear murky. Settled material should not be discharged with pool water.
- ⇒ Discharges to the environment should be directed over a land surface so that some level of filtration by soil particles can occur. The above water quality requirements also apply to land-applied water.

Applicability:

- ⇒ Any chlorinated pool owner should investigate these alternative discharge options.
- ⇒ Many pool owners who live in cooler climates drain their swimming pools to reduce maintenance and potential damage from freezing during harsh winters. These individuals should not discharge pool water to the storm sewer system or directly into a water body and should investigate alternative discharge options.



Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>



BMP Inspection and Maintenance



Description:

To maintain the effectiveness of postconstruction storm water control best management practices (BMPs), regular inspection of control measures is essential. Generally, inspection and maintenance of BMPs can be categorized into two groups—expected routine maintenance and nonroutine (repair) maintenance. Routine maintenance refers to checks performed on a regular basis to keep the BMP in good working order and aesthetically pleasing. In addition to maintaining the effectiveness of storm water BMPs and reducing the incidence of pests, proper inspection and maintenance is essential to avoid the health and safety threats inherent in BMP neglect. The failure of structural storm water BMPs can lead to downstream flooding, causing property damage, injury, and even death.

Advantages:

- ⇒ Efficient way to prevent nuisance situations (odors, mosquitoes, weeds, etc.), reduce the need for repair maintenance, and reduce the chance of polluting storm water runoff by finding and correcting problems before the next rain.
- ⇒ Because maintenance work for storm water BMPs is usually not technically complicated (mowing, removal of sediment, etc.), workers can be drawn from a large labor pool.

Disadvantages:

- ⇒ As structural BMPs increase in their sophistication, more specialized (more costly) maintenance training might be needed to sustain BMP effectiveness.
- ⇒ Not all materials that may be needed for emergency structural repairs are immediately available.

Siting and Design Considerations:

- ⇒ In the case of vegetative or other infiltration BMPs, inspection of storm water management practices following a storm event should occur after the expected drawdown period for a given BMP. This allows the inspector to see whether detention and infiltration devices are draining correctly.
- ⇒ Inspection checklists should be developed for use by BMP inspectors. Checklists might include each BMP's minimum performance expectations, design criteria, structural specifications, date of implementation, and expected life span. In addition, the maintenance requirements for each BMP should be listed on the inspection checklist. This will aid the inspector in determining whether a BMP's maintenance schedule is adequate or needs revision. Also, a checklist will help the inspector determine renovation or repair needs.

Maintenance:

It is important that routine maintenance and nonroutine repair of storm water BMPs be done according to schedule or as soon as a problem is discovered. Because many BMPs are rendered ineffective for runoff control if not installed and maintained properly, it is essential that maintenance schedules are maintained and repairs are made promptly. In fact, some cases of BMP neglect can have detrimental effects on the landscape and increase the potential for erosion. However, "routine" maintenance, such as mowing grasses, should be flexible enough to accommodate the fluctuations in need based on relative weather conditions. For example, more harm may be caused by mowing during an extremely dry period or immediately following a storm event.

Applicability:

Under the proposed Storm Water Phase II rule, owners and operators of small municipal separate storm sewer system (MS4) facilities would be responsible for implementing BMP inspection and maintenance programs and having penalties in place to deter infractions.

- ⇒ All storm water BMPs should be inspected for continued effectiveness and structural integrity on a regular basis. Generally, all BMPs should be checked after each storm event in addition to these regularly scheduled inspections.
- ⇒ Scheduled inspections will vary among BMPs. Structural BMPs such as storm drain drop inlet protection may require more frequent inspection to ensure proper operation.
- ⇒ During each inspection, the inspector should document whether the BMP is performing correctly, if there has been any damage to the BMP since the last inspection, and what should be done to repair the BMP if damage has occurred.

Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>





Description:

The management of storm water runoff from sites after the construction phase is vital to controlling the impacts of development on urban water quality. The increase in impervious surfaces such as rooftops, roads, parking lots, and sidewalks due to land development can have a detrimental effect on aquatic systems. Heightened levels of impervious cover have been associated with stream warming and loss of aquatic biodiversity in urban areas. Runoff from impervious areas can also contain a variety of pollutants that are detrimental to water quality, including sediment, nutrients, road salts, heavy metals, pathogenic bacteria, and petroleum hydrocarbons. An ordinance promotes the public welfare by guiding, regulating, and controlling the design, construction, use, and maintenance of any development or other activity that disturbs or breaks the topsoil or results in the movement of earth on land. The goal of a storm water management ordinance for postconstruction runoff is to limit surface runoff volumes and reduce water runoff pollutant loadings.

Ordinance

Benefits:

- ⇒ Minimize the increase in storm water runoff from any development to reduce flooding, siltation, and streambank erosion and to maintain the integrity of stream channels.
- ⇒ Minimize the increase in nonpoint source pollution caused by storm water runoff from development that would otherwise degrade local water quality.
- ⇒ Minimize the total annual volume of surface water runoff that flows from any specific site during and following development so as not to exceed the predevelopment hydrologic regime to the maximum extent practicable.
- ⇒ Reduce storm water runoff rates and volumes, soil erosion, and nonpoint source pollution, wherever possible, through storm water management controls. Ensure that these management controls are properly maintained and pose no threat to public safety.

Limitations:

- ⇒ Site inspections are required for a postconstruction storm water ordinance to be effective.

An adequate staff must be available to review permit applications and proposed plans.

Siting and Design Considerations:

The purpose of the postconstruction ordinance is to establish storm water management requirements and controls to protect and safeguard the general health, safety, and welfare of the public residing in watersheds within a jurisdiction. The following paragraphs provide the general language and concepts that can be included in the ordinance.

⇒ General Provisions

This section should identify the purpose, objectives, and applicability of the ordinance. The size of the development to which postconstruction runoff controls apply varies, but many communities opt for a size limit of 5,000 square feet or more. This section can also contain a discussion of the development of a storm water design manual. This manual can include a list of acceptable storm water treatment practices and may include the specific design criteria for each storm water practice. In addition, local communities should select the minimum water quality performance standards they will require for storm water treatment practices, and place them in the design manual.

⇒ Definitions

It is important to define the terms that will be used throughout the ordinance to assist the reader and prevent misinterpretation.



Ordinance (continued)

⇒ *Permit Procedures and Requirements*

This section should identify the permit required; the application requirements, procedures, and fees; and the permit duration. The intent of the permit should ensure that no activities that disturb the land are issued permits prior to review and approval. Communities may elect to issue a storm water management permit separate from any other land development permits required, or, as in this ordinance, to tie the issuing of construction permits to the approval of a final storm water management plan.

⇒ *Waivers to Storm Water Management Requirements*

This section should discuss the process for requesting a waiver and to whom this waiver would be applicable. Alternatives such as fees or other provisions for requesting a waiver should be addressed.

⇒ *General Performance Criteria for Storm Water Management*

The performance criteria that must be met should be discussed in this section. The performance criteria can include the following:

- All sites must establish storm water practices to control the peak flow rates of storm water discharge associated with specified design storms and reduce the generation of storm water.
- New development may not discharge untreated storm water directly into a jurisdictional wetland or local waterbody without adequate treatment.
- Annual groundwater recharge rates must be maintained by promoting infiltration through the use of structural and non-structural methods.
- For new development, structural sewage treatment plants must be designed to remove a certain percentage of the average annual postdevelopment total suspended solids (TSS) load.

⇒ *Basic Storm Water Management Design Criteria*

Rather than place specific storm water design criteria into an ordinance, it is often preferable to fully detail these requirements into a storm water design manual. This approach allows specific design information to be changed over time as new information or techniques become available without requiring the formal process needed to change ordinance language. The ordinance can then require those submitting any development application to consult the current storm water design manual for the exact design criteria for the storm water management practices appropriate for their site. Topics in the manual can include minimum control requirements, site design feasibility, conveyance issues, pretreatment requirements, and maintenance agreements.

⇒ *Requirements for Storm Water Management Plan Approval*

The requirements for a storm water management plan to be approved should be addressed in this section. This can be accomplished by including a submittal checklist in the storm water design manual. A checklist is particularly beneficial because changes in submittal requirements can be made as needed without needing to revisit and later revise the original ordinance.

⇒ *Construction Inspection*

This section should include information on the notice of construction commencement, as-built plans, and landscaping and stabilization requirements.

⇒ *Maintenance and Repair of Storm Water Facilities*

Maintenance agreements, failure to maintain practices, maintenance covenants, right-of-entry for inspection, and records of installation and maintenance activities should be addressed in this section.

⇒ *Enforcement and Penalties*

This section should include information regarding violations, notices of violation, stop work orders, and civil and criminal penalties.

Maintenance:

The operation and maintenance language in a storm water ordinance can ensure that designs facilitate easy maintenance and that regular maintenance activities are completed. In the "Maintenance and Repair of Storm Water Facilities" section of the ordinance, it is important to include language regarding a maintenance agreement, failure to maintain practices, maintenance covenants, right-of-entry for inspection, and records of installation and maintenance activities.

Applicability:

These ordinances are applicable to all major subdivisions in a municipality. The size of the development to which postconstruction storm water management runoff control applies varies, but many communities opt for a size limit of 5,000 square feet or more. Applicability should be addressed in more detail in the ordinance itself. It is important to note that all plans must be reviewed by local environmental protection officials to ensure that established water quality standards will be maintained during and after development of the site and that postconstruction runoff levels are consistent with any local and regional watershed plans.

⇒ Several resources are available to assist in developing an ordinance. EPA's 2000 postconstruction model ordinance web site (<http://www.epa.gov/nps/ordinance/postcons.htm>) provides a model ordinance and examples of programs currently being implemented. In addition, the Stormwater Managers Resource Center (<http://www.stormwatercenter.net>), which was created by the Center for Watershed Protection and sponsored by the U.S. Environmental Protection Agency, provides information to storm water management program managers in Phase II communities to assist in meeting the requirements of the National Pollutant Discharge Elimination System Phase II regulations.

Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>





Illicit Discharge

Procedures for Removing the Source of an Illicit Discharge

- ⇒ Issue hefty fines as a penalty to illicit dischargers (if they are identifiable.)
- ⇒ Continue to educate public, local businesses, in addition to identified illicit dischargers about the storm water drainage system. Inform them of the hazards associated with illegal discharges and improper disposal of waste. Provide ways for them to prevent illicit discharges.
- ⇒ Clean up floatable debris using methods found on BMP entitled: "Methods for Floatable Debris Control."

Procedures for Program Evaluation and Assessment

- ⇒ Conduct follow-up field tests periodically to monitor amount of illicit discharge. These tests will reveal whether or not the program has helped improve the storm drain water quality.

The objective of an illicit discharge investigation program is to identify and eliminate the discharge of pollutants to the storm water drainage system. Identifying illicit connections and major sources of floatable debris are key to reducing illicit discharge. Controlling illicit discharge provides important public health benefits as well as lotic ecosystem protection. However, regulating practices like **illegal dumping** is difficult because of its covert nature.

Procedures for Locating Priority Areas Likely to Have Illicit Discharges

- ⇒ Visually screen outfalls during dry weather.
- ⇒ Conduct field tests of selected pollutants as part of locating priority areas.
- ⇒ Generate a storm sewer system map, showing the location of all outfalls and the names and location of all waters that receive discharges from those outfalls.

Procedures for Tracing the Source of an Illicit Discharge

- ⇒ Again, use the map to locate outfalls where the majority of illicit discharge is found.
- ⇒ Identify illicit connections to the storm drain system. (See BMP entitled "Illicit Connections").
- ⇒ Conduct field tests to evaluate the type of illicit discharge and attempt to link to source. For example, if a great deal of floatable debris displays the same company name, then investigate that company as a potential illicit discharge source. (See BMP entitled "Floatable Debris").





Location of Illicit Discharges: Illicit Connections

Description:

Illicit connections are defined as illegal connections to storm drainage systems. A discharge of industrial wastewater to a storm sewer is "illicit" because it would ordinarily require a permit under the Clean Water Act. Many building owners or operators are not aware that improper connections exist in their facilities. Identifying and removing illicit connections is a measure for reducing storm water pollution. In extreme cases of illicit dumping, legal action is necessary.

Advantages:

- ⇒ Effect method to reduce the quantity of industrial or commercial pollutants that enter the storm drain system.

Disadvantages:

- ⇒ The cost of smoke testing, dye testing, visual inspection, and flow monitoring can be significant and time-consuming.
- ⇒ A local ordinance is necessary to provide investigators with access to private property in order to perform field tests
- ⇒ Rain fall can hamper efforts to monitor flows and visual inspections. In addition, smoke testing and dye testing may become more difficult, depending on the severity of the storm event. Smoke testing has roughly the same efficiency as door-to-door investigation, and both smoke and dye testing are more accurate than visual inspection.

Implementation:

- ⇒ Institute building and plumbing codes to prevent connections of potentially hazardous pollutants to storm drains.
- ⇒ Organize structures to be inspected by building age, with older buildings identified as priorities. Buildings whose processes have the potential to affect water quality also should be given priority.
- ⇒ Map each area to be surveyed and indicate the route of the sewer system and the locations of storm drains on the map. This enables planners to estimate the likely locations of illicit connections. A Geographic Information System (GIS) is an appropriate tool for identifying illicit discharges. The location of illicit discharges can be maintained by a geo-coded address. The attributes for illicit discharges are SIC code, owner/occupant information, inspection schedule, inspection dates, and comments.
- ⇒ Survey individual buildings to discover where connections to storm drains exist.
- ⇒ Inspect sewer lines with television equipment to visually identify all physical connections.
- ⇒ Compare the results of the field tests and the video inspection with the known connections on the map. Suspicious areas should be further investigated.
- ⇒ Institute mandatory inspections for new developments or remodeling to identify illicit connections to the storm sewer system.
- ⇒ Remove and test sediment from the catch basins or equivalent structures.
- ⇒ Inspect connections in question to determine whether they should be connected to the storm drain system or to the sanitary sewer. Use methods of identification such as dye testing, visual inspection, smoke testing, or flow monitoring, as described below.

Maintenance:

- ⇒ Identify illicit discharges with teams of at least two people (volunteers can be used), plus administrative personnel, depending on the complexity of the storm sewer system. Take baseline samples throughout the city so that future illicit discharge pollution identification efforts can be better established.

Applications:

Identifying illicit and improper connections are necessary for all sewer systems, especially in areas where pollutants with unknown sources have been detected in receiving waters.



Specific Methods for Detecting Illicit Connections

- ⇒ **Dye Testing.** Flushing fluorometric dye into suspicious downspouts can be useful to identify illicit connections. Once the dye has been introduced into the storm system via the connection in question, the water in the collection system is monitored to determine whether an illicit connection is present.
- ⇒ **Visual Inspection.** Remotely guiding television cameras through sewer lines is another way to identify physical connections.
- ⇒ **Smoke Testing.** Smoke testing is another method used to discover illicit connections. Zinc chloride smoke is injected into the sewer line and emerges via vents on connected buildings or through cracks or leaks in the sewer line. Monitoring and recording where the smoke emerges, crews can identify all connections, legal and illegal, to the sewer system. Mechanisms on drains should prevent the smoke from entering buildings; however, in some instances, this will occur. It is important to notify the public that the smoke is non-toxic, though it should be avoided as it can cause irritation of the nose and throat for some people.
- ⇒ **Flow Monitoring.** Monitoring increases in storm sewer flows during dry periods can also lead investigators to sources of infiltration due to improper connections.
- ⇒ **Infrared, Aerial, and Thermal Photography.** Researchers are experimenting with the use of aerial, infrared, and thermal photography to locate dischargers by studying the temperature of the stream water in areas where algae might be concentrated and in soils. It also examines land surface moisture and vegetative growth. This technique assumes that a failing OSDS, for example, would have more moisture in the surface soil, the area would be warmer, and the vegetation would grow faster than in the surrounding area.

Source: EPA website. Office of Water. National Menu of Best Management Practices for Storm Water Phase II. July 1, 2002. <http://www.epa.gov/npdes/menuofbmps/menu.htm>





Methods for Floatable Debris Control

Source Control:

- ⇒ The obvious first step in source control is to prevent trash from entering the drains to become floatable debris. This prevention measure requires public education about the stormwater drainage system. To further encourage proper disposal, additional trash cans may be installed in public areas to provide additional places of disposal other than the stormwater drains.
- ⇒ Bar screens and other filter type devices installed at the entrance and exit of the stormwater drain prevent some debris from continuing to the outfall. For example, the FloGard+PLUS (manufactured by KriStar Enterprises) fits in storm drains to capture sediment, debris, trash, oils and grease. This device can accommodate low, high, and sustained high flows while continuing to retain collected pollutants.
- ⇒ Consider installing pipe outlet covers on pipes at the outlet of sumped catch basins to stop both free-oil and floatable debris. An example is the SNOUT Stormwater Quality Improvement System (manufactured by Best Management Products, Inc.) that consists of a plastic hood that covers the outlet of the pipe.
- ⇒ Street sweeping, which is developed in another BMP, helps reduce the amount of refuse that ends up in the drainage system.
- ⇒ Encourage community members to recycle yard waste such as grass clippings by leaving them on their lawns instead of dumping.

End-of-Pipe Control:

Consider installing...

- ⇒ **Swirl Concentrators.** The flow into the concentrator causes a swirling motion around the removal chamber which encourages sedimentation. Units are typically sized to achieve an average of 80 percent removal of TSS over time. These devices are installed in underground vaults to effectively treat stormwater by removing and retaining sediments and floatables from site runoff. Specific products include V2BI, Vortechs, and Downstream Defender.
- ⇒ **Wet Vaults.** Wet vaults collect and hold floatable debris, bed load material, free oil and grease, settleable sediments and those dissolved pollutants including metals, nitrogen and phosphorous nutrients, and soluble organic compounds. The collected contaminants are retained by the system until they are removed by routine maintenance. Systems like the Jensen or Teichert Interceptor consist of rectangular concrete vaults that are typically multi-chambered with interior chambers separated by baffle walls. Units should be sized based on settling of particles. Other manufacturers such as BaySaver and Stormceptor design round wet vaults. All of these manufacturers produce several models with a range of flow capacities.
- ⇒ **Media Filters.** Media filters are vertical cylinders with a unit capacity of 15 gpm. Multiple cylinders can be used to accommodate the desired system capacity. These cylinders are placed in line, in a vault. Water enters radially through the filter media into an inner cylinder. The filtered water passes downward to an underlain system that is contained in the bottom slab. Media filters can maximize the flow-through rate as each cylinder contains a simple, non-mechanical vacuum device that prevents water from flowing through the cylinder until the water has risen to the top of the cylinder. Primary constituents targeted for removal include dissolved metals and nutrients. Filters can be effective where land is at a premium, but they do require regular maintenance. When filters are undersized or left unmaintained, fine sediment accumulates on their surface and clogs the filter. Stormwater Management markets a filter called a StormFilter.
- ⇒ **Deflection Screens.** Deflection screens are similar to swirl concentrators in that they have a circular removal chamber and flow moves in a circular motion. However, vortex separation is not induced with a deflection screen. Instead removal is accomplished with a screen located around the outer perimeter of the removal chamber. Settleable solids drop at the interface of the screen while the floatables pass upward. The hydraulic action in this device prevents clogging of the screen. CDS (Continuous Deflective Separation) Technologies currently manufactures this device.
- ⇒ **Check Valves.** Consider installing check valves (like the Tideflex manufactured by Red Valve Company, Inc.) to prevent backflow from washing collected floatable debris out of catchments, racks or screens. A check valve must be used in conjunction with a floatable collection system.



Table of Methods for Floatable Debris Control

Type of Device	Product	Company	Product Description	Target Constituents
Wet Vault	Jensen Interceptor	Jensen Precast	Multiple chambers in series separated by baffles. Contains standing water, or dead storage, which enhances treatment.	Settleable and floatable solids, oil/grease and particulate pollutants.
Wet Vault	Teichert Interceptor	Teichert Precast	Multiple chambers in series separated by baffles. Contains standing water, or dead storage, which enhances treatment.	Settleable and floatable solids, oil/grease and particulate pollutants.
Wet Vault	BaySaver	BaySaver, Inc.	Two standard manholes. One for removal of sediment and separation of floatables which are diverted by a special device into the other manhole for storage. Diversion device passes extreme flows through the unit.	Settleable and floatable solids, oil/grease and particulate pollutants.
Wet Vault	Stormceptor	CSR Hydro Conduit	A weir insert placed in a round manhole vault to improve hydraulics thereby improving removal efficiency and retention of sediment. Device can handle low and high flows.	Settleable and floatable solids, oil/grease and particulate pollutants.
Swirl Concentrator	Downstream Defender	H.I.L. Technology, Inc.	Uses vortex separation with device installed in a round single manhole vault.	Settleable and floatable solids, oil/grease and particulate pollutants.
Swirl Concentrator	Vortechs	Vortechnics	Vortex separation with the swirl device placed in a rectangular, shallow vault. Comes in nine standard sizes.	Settleable and floatable solids, oil/grease and particulate pollutants.
Swirl Concentrator	V2B1	Vistner Concrete	Two manholes in series. Vortex separation removes particulates and floatables in first manhole. Floatables move to a chamber in the second manhole for storage. Diverter in first manhole bypasses high flows on opposite sides of the screen which also prevents clogging of the screen.	Settleable and floatable solids, oil/grease and particulate pollutants.
Deflection Screen	CDS (Continuous Deflective Separation)	CDS Technologies	Circular device in which flow is directed to create circular flows like a vortex. Removal occurs as the water passes through a screen around the outer perimeter. Removal induced by countercurrent flows on opposite sides of the screen which also prevents clogging of the screen.	Settleable and floatable solids, oil/grease and particulate pollutants.
Media Filter	StormFilter	Stormwater Management	Vertical cylinder with media of various types placed in the cylinder. Water enters laterally through the filter, enters a vertical center well which exits to an underdrain system. Number of cylinders is a function of design peak flow.	Varies with media. All reduce settleable solids. Some remove dissolved nutrients or dissolved metals.
Check Valve	Tideflex	Red Valve Company, Inc.	Used in conjunction with a floatable collection system, a check valve prevents backflow from washing collected debris out of catchments.	Floatable debris
Bar Screen	FloGard+PLUS	KriStar Enterprises	Fits in storm drain to collect pollutants. This device accommodates low, high, and sustained high flows.	Sediment, debris, trash, oils and grease.
Pipe Outlet Cover	SNOUT Stormwater Quality Improvement System	Best Management Products, Inc.	Plastic hood that covers pipe outlet of sumped catch basins.	Floatable debris and free-oil.



Source: Sacramento Stormwater Management Program. "Investigation of Structural Control Measures for New Development." Prepared by Larry Walker Assoc., Nov. 1999.



BLACK & VEATCH CORPORATION

DRAFT – TECHNICAL MEMORANDUM No. 3



Goals and Objectives of Storm water Management Plan
City of Lodi Storm water Master Plan and
Phase II NPDES Permit

B&V PN: 131547.0300
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This document, Technical Memorandum Number 3, details the results of the process to establish goals and objectives for the NPDES Phase II program for the City of Lodi (City). It includes an outline of the goals, objectives, selected Best Management Practices (BMPs) and implementation strategy that will be included in the Storm water Management Plan. It has been prepared by Black & Veatch Corporation to satisfy the requirements of Task 3 of the City of Lodi NPDES Phase II project scope of work.

Technical Memorandum Number 1 details the current storm water management system and storm water operations and maintenance (O&M) practices in the City of Lodi. It was prepared by Black & Veatch to satisfy the requirements of Task 1 of the City of Lodi NPDES Phase II project scope of work.

Technical Memorandum Number 2 details the permit requirements established by the EPA and the current thinking of the Central Valley Regional Water Quality Control Board (RWQCB) regarding the National Pollution Discharge Elimination System (NPDES) Phase II permit requirements. It was prepared to satisfy the requirements of Task 2: Determine RWQCB requirements, of the Lodi NPDES Phase II project scope of work.

1. GOALS

At a project kickoff meeting with Black & Veatch Corporation on April 10, 2002, City Staff articulated the following goals for the NPDES Phase II Project:

- The city would like the report to be useful to the City Council in the development of a storm water ordinance. Key aspects of the ordinance would include:
 - ♦ Enforceable penalties for noncompliance (i.e. fines, education)
 - ♦ Clear definitions of accountability
 - ♦ Make the discharge of non-permitted water into the municipal separate storm sewer system (MS4) illegal
 - ♦ Identification of methods to enforce noncompliance including education
- Specific Best Management Practices (BMPs) to address the following categories
 - ♦ Erosion control – The City currently has no published construction standards. Develop BMPs incorporating development of construction standards.
 - ♦ Catch basin filters – The City would like a new design standard proposed
 - ♦ Potential for an incentive based system. (i.e. developers put a deposit down at the beginning of project, funds could be deducted for noncompliance, following the completion of the project, remaining money would be returned to the contractor)
 - ♦ Construction site washout of concrete and similar materials. Caltrans currently has a BMP in place, the City would like a similar BMP developed
 - ♦ Street Sweeping

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- ◆ Control of floatables in storm water
- ◆ Guidance on identification of private storm water drainage lines
- ◆ Shut down gates to isolate storm water management facilities
- ◆ “Fundraiser” type car washes
- ◆ Information on the potential of using trees as an erosion control BMP
- The City expects the project to be completed on time/on budget
- The City would appreciate some help from B&V with suggestions on how to fund the program including information of funding sources. Cost estimates will be provided as part of a future Technical Memo.
- The City expects a permit that is livable from an O&M standpoint in terms of costs and manpower
- The City would like help in development of educational material. Educational targets include: city employees, known polluters and general public
- The City expects BMPs to be presented on a standard 8.5” x 11” sheet of paper oriented in the landscape format

2. Outline of Storm water Strategy

The following is an outline of the strategy the City will follow in order to meet the requirements of the EPA’s Phase II NPDES requirements. For more information on the specific requirements of the Phase II program, please see Technical Memorandum No. 2. Information on the proposed BMPs is detailed in attachments to this memorandum. Similar programs implemented in other areas of the United States are included, for information, as an attachment to this memorandum. It should be noted that many of the BMPs identified can be considered under several different NPDES program categories, however, each BMP is only discussed one time.

The following tables outlines the current and proposed future BMPs the City will use in order to comply with the requirements of the Phase II rule.

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Table 2-1 - Current BMPs

	NPDES Phase II Program Categories					
	Public Education and Outreach	Public Participation/ Involvement	Illicit Discharge Detection and Elimination	Construction Site Runoff Control	Post-Construction Runoff Control	Pollution Prevention/ Good Housekeeping
Lodi All Emergency Preparedness Expo	X	X				
Storm Drain Detectives	X	X	X			X
Catch Basin Marking	X	X	X			X
Lodi Municipal Code	X	X	X			X
Erosion Control for Construction				X		
Urban Forestry					X	X
Detention Ponds					X	X
Current Inspection Policies						X
City Design Standards				X	X	
Mokelumne River Watershed Owner's Manual	X	X				X
Water conservation programs in local elementary schools	X	X				X

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Table 2-2 - Recommended BMPs

	NPDES Phase II Program Categories					
	Public Education and Outreach	Public Participation/ Involvement	Illicit Discharge Detection and Elimination	Construction Site Runoff Control	Post-Construction Runoff Control	Pollution Prevention/ Good Housekeeping
Continue participation in Mokelumne River Watershed Owner's Manual	X	X				X
BMP Inspection and Maintenance			X	X	X	X
Check Dam				X		
Classroom Education	X	X				
Community Car Washing	X	X				X
Community Hotline	X	X	X			
Concrete Washout				X		
Construction Entrance				X		
Contractor/Inspector Training				X		
Disposal of Chlorinated Water			X			X
Dry Extended Detention Pond					X	X
Educational Pamphlets	X	X	X			X
Floatable Debris Control		X			X	X
Grass-lined Swale					X	X
Illicit Discharge Programs		X	X			
Inlet Protection				X		
Ordinance	X	X	X	X	X	X
Outlet Protection				X		
Sand or Biofilter Bag Sediment Barriers				X		
Storm Drain Cleaning						X
Storm Drain Labeling	X	X	X			X
Straw Bale or Roll Sediment Barriers				X		
Street Cleaning						X
Tire Wash Facility				X		
Storm water Quality Video	X	X				X
Urban Forestry					X	

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2.1. Public Education and Outreach

An informed and knowledgeable community is crucial to the success of a storm water management program since it helps to ensure greater support and compliance.

2.1.1. Summary of Regulatory Requirements¹

The NPDES Phase II regulations require that the City implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff.

2.1.2. Summary of Existing Practices

2.1.2.1. Lodi All Emergency Preparedness Expo

The City sponsors and participates in the Lodi All Emergency Preparedness Expo. The Expo is a free event featuring workshops and presentations from various safety and emergency response organizations, designed to increase public awareness on a variety of safety issues including storm water awareness.

2.1.2.2. Lodi Municipal Code

Multiple sections of the Lodi Municipal Code provide measures intended to protect the quality of storm water runoff. The City recognizes that the existing ordinance does not meet all of the requirements of the Phase II NPDES program. In an effort to comply with the rule, the ordinance will be restructured to include storm water provisions as a separate section in the existing Chapter 13.12 titled "Sewer Service".

2.1.2.3. Mokelumne River Watershed Owner's Manual

The Mokelumne River Watershed Owner's Manual was developed to educate the public on the impacts of non-point sources of pollution on the River. The manual identifies common sources of pollution and outlines strategies that homeowners can take to minimize their impact. Chapters include: "Storm water Management", "Household Wastewater", "Managing Household Hazardous Products", and "Yard and Garden Care".

2.1.3. Recommended BMPs

The City will implement a two tiered approach to public education communicating the importance of storm water quality protection to both children and adults in the community. Adults will be educated through a brochure or flyer included as a mailer with a utility bill from

¹ Summary of Regulatory Requirements is based on Federal Law and Draft Water Discharge Requirements from the California State Water Resources Control Board. Before the plan is implemented a review of the final California Requirements should be reviewed.

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the City. Additionally, adults in the area will see the results of a storm water protection poster contest held annually at local schools and described below.

Following a brief educational session, local students will be encouraged to participate in a poster contest with a theme relating to storm water protection. The results will be judged by City public works staff. The winning posters will be posted on a billboard in City Hall or other public place.

Additional public contact will be made through appropriate media that may include presentations at a local theater or newspaper. The City has recently agreed to participate in the production of a video aimed at storm water quality in the Central Valley. This video will be used by the City as a public education tool.

2.1.4. Measurable Goals

Table 2-3 - Public Education and Outreach Measureable Goals

Target Date	Activity
2003	Bilingual storm water protection brochures or flyers developed and distributed in water utility bills, school curricula developed Continue participation in local events such as the Lodi All Emergency Preparedness Expo
2004	Begin annual poster contest and post winning posters on bulletin boards around the City Continue participation in local events such as the Lodi All Emergency Preparedness Expo Participate in development of storm water quality video
2005	Continue poster contest program Implement program to reduce the dumping of pollutants down storm sewer drains Continue participation in local events such as the Lodi All Emergency Preparedness Expo
2006	Continue poster contest program Implement program to reduce volume of floating contaminants in storm drain system Continue participation in local events such as the Lodi All Emergency Preparedness Expo

2.2. Public Participation/Involvement

The EPA believes that the public can provide valuable input and assistance to a regulated small MS4's municipal storm water management program and suggests that the public be given opportunities to play roles in developing and implementing the program. The EPA feels that an active and involved community is crucial to the success of a storm water management program because it allows for broader public support, shorter implementation schedules, a broader base of expertise, economic benefits and a conduit to other programs.

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2.2.1. Summary of Regulatory Requirements²

The City of Lodi must, at a minimum, comply with state, tribal, and local public notice requirements when implementing a public involvement/participation program. The City must also must make copies of the General Permit and Storm water Management Program available to the public for review.

2.2.2. Summary of Existing Practices

2.2.2.1. Storm Drain Detectives

In October 2000, the City of Lodi's Public Works Department began a local Citizen Monitoring Program of the Mokelumne River where the City's storm drains enter the river. The "Storm Drain Detectives" is a collaborative effort of the City of Lodi Public Works Department, State Water Resources Control Board-Division of Water Quality, Lodi Lake Nature Area Docent Council and four local high schools. Monthly water quality monitoring of nine locations along the Mokelumne River and Lodi Lake is done by students and teachers, grades 7-12, and other volunteers who have been trained by a program coordinator. This work done by students is often cited for school credit. Funding for the program comes from the City of Lodi, Public Works Department. For more details about the program, sampling locations and monitoring results, go to the City of Lodi web site at <http://www.lodi.gov/html/directory.html> and click on "Storm Drain Detectives".

In previous years, the Storm Drain Detectives have not received funding from any outside source. The Program was established partly in lieu of a fine against the City's Wastewater Treatment Plant and was fully funded by the City. Beginning in May 2002, partial funding will be provided by a CALFED grant. The City's portion of the funding is shown below.

Table 2-4 - City of Lodi, Public Works Department Budget

	2000-01	2001-02	2002-2003	
			City Budget	CALFED grant
Personnel Services	\$6,000	\$7,000		
Conference Expense	\$225	\$300		
Professional Services	\$4,700	\$2,700		
Special Department Materials	\$9,000	\$3,000		
Total	\$19,925	\$13,000		

² Summary of Regulatory Requirements is based on Federal Law and Draft Water Discharge Requirements from the California State Water Resources Control Board. Before the plan is implemented a review of the final California Requirements should be reviewed.

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2.2.2.2. Catch Basin Marking

As an Eagle Scout project, about 60% of the existing storm drain catch basins have been labeled with placards indicating water is discharged to the river and that no dumping is allowed. Newly installed catch basins include placards.

2.2.3. Recommended BMPs

The City will involve the public in completing its storm drain labeling program in a manner similar to the Eagle Scout projects that were previously completed. The City will also establish a toll-free citizen reporting telephone number or an electronic form linked directly to the Public Works Department. The hotline or form will be advertised with the local media. A typical call to the hotline might report a parked automobile leaking fluid, fresh concrete wash-out dumped on to a city street, paint or oily sheen in the River, or organic debris (including pet waste) in a drainage system or waterway. The City will then promptly respond and attempt to remedy the reported problem. A log of all reported incidents will be maintained and included in the annual NPDES compliance report to RWQCB.

The City will also continue to fund and look for additional grant funding opportunities for the Storm Drain Detectives Program.

2.2.4. Measurable Public Participation Goals

Table 2-5 – Public Participation/Involvement Measureable Goals

Target Date	Activity
2003	Establish citizen reporting hotline or an internet accessible electronic form Increased participation in Storm Drain Detectives Program
2004	Material in local media promoting hotline or internet accessible electronic form Quick response to hotline complaints
2005	Storm drain labeling complete
2006	Generate annual report to citizens on storm water

2.3. Illicit Discharge Detection and Elimination

Discharges from MS4s may include wastes and wastewater from non-storm water sources. Illicit discharges enter the system through either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drain system) or indirect connections (e.g., infiltration into the MS4 from cracked sanitary systems, spills collected by drain outlets, or paint or used oil dumped directly into a drain). The result is untreated discharges that contribute high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving waterbodies. Pollutant levels from these illicit discharges have been shown in EPA studies to be high enough to significantly degrade receiving water quality and

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threaten aquatic, wildlife, and human health. It is important to note that currently, limited data on the Mokelumne River indicates that water is relatively pure and minimally impacted by storm water discharges.

2.3.1. Summary of Regulatory Requirements³

To comply with NPDES Phase II program requirements, the City of Lodi must:

- Develop, implement and enforce a program to detect and eliminate illicit discharges (as defined at Sec. 122.26(b)(2)) into the small MS4.
- Develop, if not already completed, a storm sewer system map, showing the location of all outfalls and the names and location of all waters of the United States that receive discharges from those outfalls;
- To the extent allowable under State, Tribal or local law, effectively prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges into the municipal storm sewer system and implement appropriate enforcement procedures and actions;
- Develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, to the MS4 system; and
- Inform public employees, businesses, and the general public of hazards associated with illegal discharges to the MS4 and improper disposal of waste.
- The City needs to address the following categories of non-storm water discharges or flows (i.e., illicit discharges) only if they represent significant contributors of pollutants to the small MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water (discharges or flows from fire fighting activities are excluded from the effective prohibition against non-storm water and need only be addressed where they are identified as significant sources of pollutants to waters of the United States).

2.3.2. Summary of Existing Practices

2.3.2.1. Storm Drain Outlets

The City maintains a map showing the location of all outfalls and the names and locations of all waters of the United States that receive discharges from those outfalls.

³ Summary of Regulatory Requirements is based on Federal Law and Draft Water Discharge Requirements from the California State Water Resources Control Board. Before the plan is implemented a review of the final California Requirements should be reviewed.

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2.3.3. Recommended BMPs

The City will develop and implement a program to detect and eliminate illicit discharges into the storm sewer system built around an updated wastewater ordinance storm water ordinance. As a first phase of the program, the City will identify problem areas based on citizen complaints, visual screening, or water sampling from manholes and outfalls during dry weather. Phase II will involve tracking the detected contamination to its source. Methods that can find the source of the illicit discharge include: dye-testing buildings in problem areas; dye- or smoke-testing buildings; tracing the discharge upstream in the storm sewer; employing a field verification program that shows that a building has been checked for illicit connections; or using video to inspect the storm sewers for illicit connections. Following source identification, the offending discharger should be notified in writing and directed to correct the problem within a reasonable time frame. All steps taken under the plan will be documented to illustrate that progress is being made to eliminate illicit connections and discharges to the MS4.

2.3.4. Measurable Goals

Table 2-6 – Illicit Discharge Detection and Elimination Measureable Goals

Target Date	Activity
2003	Develop ordinance Identify and evaluate non-storm water discharge
2004	Ordinance in effect Begin program to identify source of problem areas; including record keeping
2005	Continue to track source of problem areas Eliminate detected illicit discharges
2006	Most illicit discharge sources detected and eliminated

2.4. Construction Site Runoff Control

Polluted storm water runoff from construction sites often flows to MS4s and is ultimately discharged into local rivers and streams. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. The resulting siltation, and the contribution of other pollutants from construction sites, can cause physical, chemical, and biological harm our nation's waters.

2.4.1. Summary of Regulatory Requirements⁴

- The City must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction activities that result in a land disturbance of

⁴ Summary of Regulatory Requirements is based on Federal Law and Draft Water Discharge Requirements from the California State Water Resources Control Board. Before the plan is implemented a review of the final California Requirements should be reviewed.



greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more.

- The program must include the development and implementation of, at a minimum:
 - ◆ An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal, or local law;
 - ◆ Requirements for construction site operators to implement appropriate erosion and sediment control (ESC) best management practices;
 - ◆ Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality;
 - ◆ Procedures for site plan review which incorporate consideration of potential water quality impacts;
 - ◆ Procedures for receipt and consideration of information submitted by the public;
 - ◆ Procedures for site inspection and enforcement of control measures (grading permits);
 - ◆ A program to inspect construction sites and enforce actions against violators.

2.4.2. Summary of Existing Practices

2.4.2.1. Erosion Control for Construction

Developers are required to address erosion control on all plan submittals that impact sites greater than one acre in size. Typical measures shown on plans include:

- Construction vehicle access control
- Temporary berms/sandbags
- Material stockpile locations
- Sweeping schedules
- Hay wattles (see sample installation diagram below)
- Installation and maintenance of catch basin filter screens (See City Standard Plan 313 attached to this report)
- Installation of front yard swales as shown on the figures below

During construction, the owner/developer is responsible for maintaining effective erosion control throughout the duration of the project. Typical provisions include:

- Removal of any sediment deposited on existing paved roadways prior to leaving the work site, if possible, and in all cases at the end of the work day or within 24 hours, whichever is sooner

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- Plowing or ripping of all lot pads (rear of hinge line) prior to October 1 to a depth of 2"-3".
- Placement of "rock bags" at 200-300' intervals to isolate sediment prior to October 1 or threat of major rain prior to that date. Sediment to be removed weekly (or sooner, if large accumulation occurs or another storm is predicted).

The following construction standards are currently utilized by the City of Lodi for erosion control.

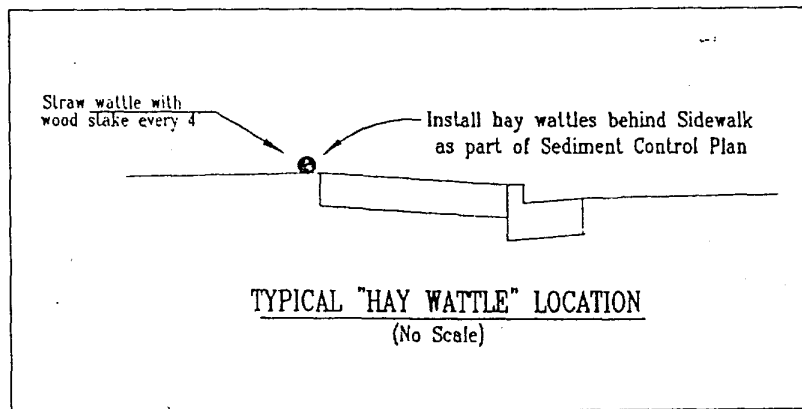


Figure 2-1 - Typical "Hay Wattle" Location

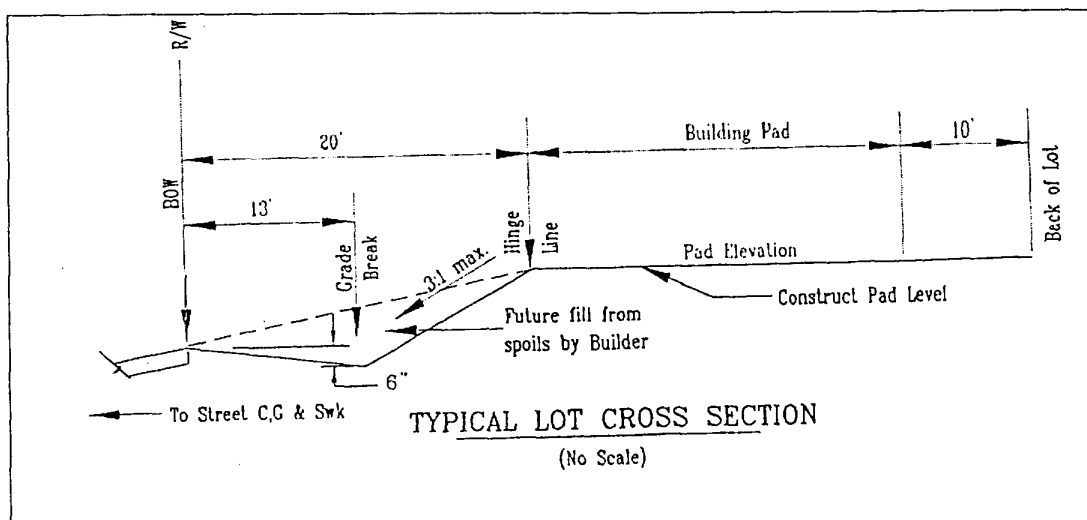


Figure 2-2 - Typical Lot Cross Section

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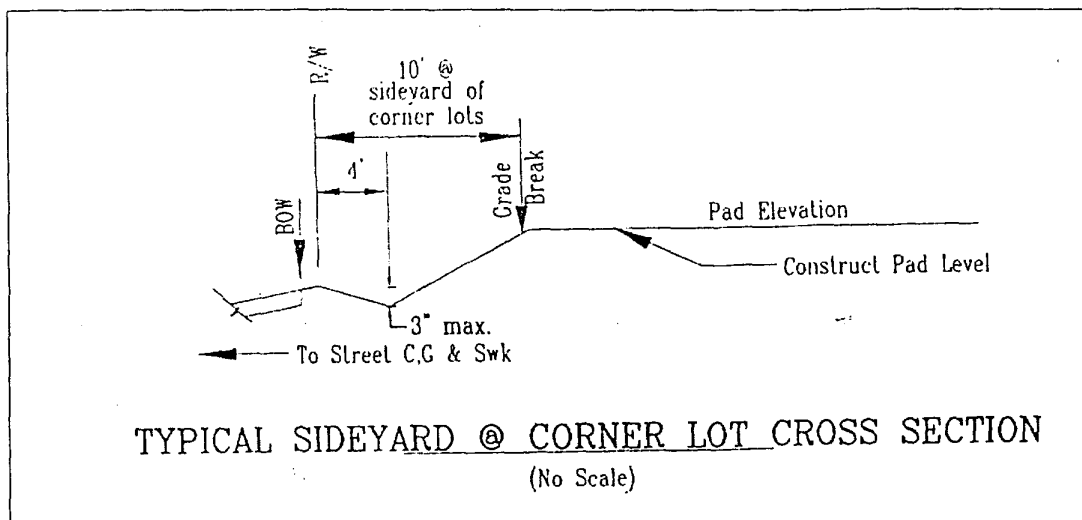


Figure 2-3 - Typical Sideyard at Corner Lot Cross Section

2.4.3. Recommended BMPs

The City will include in their Storm water Protection Ordinance a section dedicated to construction site runoff control. Key BMPs to be enforced by the ordinance are listed below and detailed in the attachments to this report.

Probable requirements of the City of Lodi Storm water Protection Ordinance:

- Construction entrance
- Tire wash facility
- Outlet protection
- Check dams
- Straw sedimentation barriers
- Inlet protection
- Sand and biofilter bags
- Concrete washout
- Training



2.4.4. Measurable Goals

Table 2-7 – Construction Site Runoff Control Measureable Goals

Target Date	Activity
2003	Develop Ordinance Develop training materials Develop inspection program
2004	Ordinance in place Training program in place Begin construction site inspections
2005	Maximum compliance with ordinance Improved clarity and reduced sedimentation of local waterbodies
2006	Improved clarity and reduced sedimentation of local waterbodies

2.5. Post-Construction Runoff Control

Post-construction storm water management in areas undergoing new development or redevelopment is necessary because runoff from these areas has been shown to significantly effect receiving waterbodies. Many studies indicate that prior planning and design for the minimization of pollutants in post-construction storm water discharges is the most cost-effective approach to storm water quality management.

2.5.1. Summary of Regulatory Requirements⁵

- The City must develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4. The program must ensure that controls are in place that would prevent or minimize water quality impacts.
- The City must:
 - ♦ Develop and implement strategies which include a combination of structural and/or non-structural best management practices (BMPs) appropriate for the community;
 - ♦ Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal or local law;
 - ♦ Ensure adequate long-term operation and maintenance of BMPs.

⁵ Summary of Regulatory Requirements is based on Federal Law and Draft Water Discharge Requirements from the California State Water Resources Control Board. Before the plan is implemented a review of the final California Requirements should be reviewed.

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2.5.2. Summary of Existing Practices

2.5.2.1. Detention Basins

Several storm water detention basins are currently operated by the City to control runoff for events up to the 100-year storm. These detention basins also function as sports facilities (baseball fields, soccer fields, etc.) during non-storm periods but their primary purpose is flood control. Table 2-8 summarizes information about the storm drain basins maintained by the City.

Table 2-8 - Storm Drain System Basin Data

Basin/Park	Tributary Area (acres)	Site Land Area (acres)	Storage Volume (ac. ft.)
A-1, Kofu	524	12 ¹	41.5
A-2, Beckman	542	16.2 ²	60.0
B-1, Vinewood	925	16.0	41.5
B-2, Graves ³	148	13.2	31.1
C, Pixley ⁴	1,101	27.3	128.7
D, Salas	815	21.0	94.0
E, Peterson	320	20.9	61.0
F (at Kettleman)	392	30.0	68.5
F (near Tokay)	392	30.0	68.5
G (DeBenedetti)	888	46.3	202.0
H (Discharge to River)			
I (Undeveloped)		25.0	
Total	6,047	227.9	728.3

Italics indicate future or partially complete facilities. ¹ Kofu acreage includes park south to tennis courts, excludes Municipal Service Center (MSC) & MSC parking. ² Beckman acreage excludes Fire Station. ³ Graves Park formerly Twin Oaks Park. ⁴ Pixley volume does not include 7 Ac. Ft. in Beckman Rd. ditch

2.5.2.2. Urban Forestry

Numerous environmental and storm water benefits can be achieved through effective use of urban forestry. Trees can act as natural storm water management areas by filtering particulate matter (pollutants, some nutrients, and sediment) and by adsorption of water. Urban forestry also reduces noise levels, provides recreational benefits and increases property values and has been shown to reduce petty crime and vandalism rates.

The City of Lodi Public Works Department attempts to maintain and protect trees. Currently the City is in the process of developing an Urban Forest Management Plan to assess the present condition of the urban forest, provide cost projections for future maintenance, assist with the budget process, and to project and monitor changes in the forest over time. Not including those associated with Capital projects, the City plants approximately 250 trees a year and removes between 30 and 100 trees.

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The City has currently submitted an application for membership in the Tree City USA program. The program requires the City to establish a Tree Board or Department, a Tree Care Ordinance, a Community Forestry Program with an annual budget of at least \$2 per capita, and an Arbor Day Observance and Proclamation.

2.5.3. Recommended BMPs

The City will continue to build detention ponds as the size of the city increases and storm water detention needs grow. The City will also continue its urban forestry program. These and other structural and/or nonstructural BMPs will be required by the Storm water Protection Ordinance. Potential BMPs are included in the attachments to this reports and include: BMP inspection and maintenance, grass line swales and floatable debris removal.

2.5.4. Measurable Goals

Table 2-9 – Post-Construction Runoff Control Measureable Goals

Target Date	Activity
2003	Develop ordinance
2004	Ordinance in place
2005	Reduce percent of new impervious surfaces associated with new development projects
2006	Improved clarity and reduced sedimentation of local waterbodies

2.6. Pollution Prevention/Good Housekeeping

The Pollution Prevention/Good Housekeeping measure requires the City of Lodi to examine and subsequently alter their own actions to help ensure a reduction in the amount and type of pollution that: (1) collects on streets, parking lots, open spaces, and storage and vehicle maintenance areas and is discharged into local waterways; and (2) results from actions such as environmentally damaging land development and flood management practices or poor maintenance of storm sewer systems. This measure, while primarily meant to improve or protect receiving water quality, can also result in a cost savings for the City by encouraging proper and timely maintenance of storm sewer systems which will help avoid repair costs from damage caused by deterioration and neglect.

2.6.1. Summary of Regulatory Requirements⁶

The City must develop and implement an operation and maintenance program that includes a training component which has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. Using training materials that are available from EPA, the State of

⁶ Summary of Regulatory Requirements is based on Federal Law and Draft Water Discharge Requirements from the California State Water Resources Control Board. Before the plan is implemented a review of the final California Requirements should be reviewed.

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California, or other organizations, the program must include employee training to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance.

2.6.2. Summary of Existing Practices

2.6.2.1. Inlets and Manholes

All system inlets and manholes are opened and inspected at least once annually. At the time of inspection, the manholes are cleaned and maintained/repared as necessary.

2.6.2.2. Catch Basins

Catch basins are inspected and cleaned by hand annually. Liquid from the basins is decanted into the sanitary sewer and solids are sent to the municipal wastewater treatment facility and ultimately to a landfill.

2.6.2.3. Pipelines

The City maintenance plan includes cleaning of system storm pipes. In 1999-2000 the city cleaned approximately 30 miles of storm line. In 2000-2001, 2001-2002 and 2002-2003 the city cleaned 35, 40, and 40 miles of storm drain, respectively. The City maintains approximately 110 miles of pipeline within the City.

2.6.2.4. Outlets

Stormdrain outfalls are inspected by the City annually. During the inspection, pictures detailing the condition of the outlet are taken, outlet and area conditions are noted, and maintenance recommendations are made.

2.6.2.5. Street Sweeping

Street sweeping is a regular maintenance activity accomplished by City employees. In March, 2002 the City hired an additional maintenance worker and purchased a second sweeper truck for the purpose of increasing street sweeping frequency. Following the hire of the new employee street sweeping frequency was doubled and currently is as follows: residential areas are swept twice per month, parking lots and alleys are swept once per month, the downtown area is swept three times per week and major roadways are swept once per week. The City also uses a sidewalk sweeper to remove debris from the downtown area.

Currently, the City is developing a plan to deal with vehicles that hinder street sweeping. As currently envisioned, when the City is unable to sweep an area due to vehicles in the street, notices will be left on the vehicles. If the parked vehicle continues to be a problem, letters will be sent to local property owners. If the problem continues, temporary no parking signs will be placed in the area and vehicles blocking access will be towed.

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Private property owners are required to sweep their parking lots weekly.

2.6.3. Recommended BMPs

The City recognizes the storm water pollution potential from fundraiser and personal carwashes as well as disposal of chlorinated water from pools or other sources may detrimentally impact the quality of discharged water. The city will develop and implement a public education program targeting these types of discharges in an effort to reduce their impact and will consider offering devices designed to prevent the discharge of car wash water to storm drains.

2.6.4. Measurable Goals

Table 2-10 – Pollution Prevention/Good Housekeeping Measureable Goals

Target Date	Activity
2003	Educational brochures developed and outreach program developed
2004	Materials distributed
2005	Programs reviewed, evaluated and revised as necessary
2006	Floatables in storm water reduced Generate annual report to citizens on storm water

3. Summary

The following table summarizes the BMPs and implementation schedule the City will follow to comply with the Phase II NPDES program.



Table 3-1 - Implementation Schedule Summary Table

Implementation Year	Public Education and Outreach	Public Participation/Involvement	Illicit Discharge Detection and Elimination	Construction Site Runoff Control	Post Construction Runoff Control	Pollution Prevention/Good Housekeeping
2003	<ul style="list-style-type: none"> Bilingual storm water protection brochures or flyers developed and distributed in water utility bills, school curricula developed Continue participation in local events such as the Lodi All Emergency Preparedness Expo 	<ul style="list-style-type: none"> Establish citizen reporting hotline or an internet accessible electronic form Increase participation in Storm Drain Detectives Program 	<ul style="list-style-type: none"> Develop ordinance to identify and evaluate non-storm water discharge 	<ul style="list-style-type: none"> Develop Ordinance Develop training materials 	<ul style="list-style-type: none"> Develop ordinance 	<ul style="list-style-type: none"> Educational brochures developed and outreach program developed
2004	<ul style="list-style-type: none"> Begin annual poster contest and post winning posters on bulletin boards around the City Continue participation in local events such as the Lodi All Emergency Preparedness Expo Participate in development of storm water quality video 	<ul style="list-style-type: none"> Material in local media promoting hotline or internet accessible electronic form Quick response to hotline complaints 	<ul style="list-style-type: none"> Ordinance in effect Begin program to identify source of problem areas; including record keeping 	<ul style="list-style-type: none"> Ordinance in place Training program in place 	<ul style="list-style-type: none"> Ordinance in place 	<ul style="list-style-type: none"> Materials distributed
2005	<ul style="list-style-type: none"> Continue poster contest Implement program to reduce the dumping of pollutants down storm sewer drains Continue participation in local events such as the Lodi All Emergency Preparedness Expo 	<ul style="list-style-type: none"> Storm drain labeling complete 	<ul style="list-style-type: none"> Continue to track source of problem areas Eliminate detected illicit discharges 	<ul style="list-style-type: none"> Maximum compliance with ordinance Improved clarity and reduced sedimentation of local waterbodies 	<ul style="list-style-type: none"> Reduce percent of new impervious surfaces associated with new development projects 	<ul style="list-style-type: none"> Programs reviewed, evaluated and revised as necessary
2006	<ul style="list-style-type: none"> Continue poster contest Implement program to reduce volume of floating contaminants in storm drain system Continue participation in local events such as the Lodi All Emergency Preparedness Expo 	<ul style="list-style-type: none"> Generate annual report to citizens on storm water 	<ul style="list-style-type: none"> Most illicit discharge sources detected and eliminated 	<ul style="list-style-type: none"> Improved clarity and reduced sedimentation of local waterbodies 	<ul style="list-style-type: none"> Improved clarity and reduced sedimentation of local waterbodies 	<ul style="list-style-type: none"> Floatables in storm water reduced Generate annual report to citizens on storm water

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4. Attachments

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4.1. Sample Car Wash Educational Programs

4.1.1. King County

The following is from the King County, Washington webpage available at <http://dnr.metrokc.gov/wlr/pi/carwash.htm>.



King County

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News

Services

Comments

Search



Natural Resources and Parks »
Water and Land Resources Division »

Clean Water Car Wash Kits

Hold your charity car wash without sending water quality down the drain...borrow a FREE Clean Water Car Wash Kit!

Did you know that water which flows into most storm drains dumps right into the closest body of water without treatment? When you wash cars in a parking lot, the used wash water carries dirt, soap, and oil into streams, lakes, wetlands, and Puget Sound.

But you can help prevent this! **If you plan a charity car wash, borrow a FREE Clean Water Car Wash kit from King County.**

Wash water is kept out of the storm drain system through a simple arrangement that captures and pumps dirty water to the sanitary sewer for treatment. When you borrow a kit, you receive signs letting people know that your car wash is good for salmon and water quality. You also get flyers that describe the benefits of the car wash kit and how people can help keep our waterways clean. So it's easy... you raise money and help protect salmon and water quality! **Contact Lexi Taylor, King County Clean Water Car Wash Kit Coordinator, at (206) 296-8287, Toll-Free (800) 325-6165 Extention 68287 or <mailto:Lexi.taylor@metrokc.gov> to borrow a kit.**

An alternative for a fundraising car wash is the Puget Sound Car Wash Association's (PSCWA) Charity Car Wash Program. Fundraisers sell tickets redeemable at participating commercial car washes to raise money for their charity. Not only do most commercial car washes recycle water, but they also use less water per wash than a home car wash and remove solids before discharging wastewater to the sanitary sewer. **Call PSCWA's hotline, Toll-Free (800) 509-9274, or check out their web site at <http://www.pugetsound.org/countdown/carwash.html>.**

If you wash your car at home, chances are that soapy water (and everything you just

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washed off your car) will head straight for fish habitat in your neighborhood. And all soaps, even biodegradable ones, are toxic to fish. Make sure to wash your car on a grassy or gravel-covered area so that the wash water will filter through the soil and not go directly into a storm drain. You can also take it to a commercial car wash.

Together we can make a difference for water quality and salmon!

For questions about this Web site, please contact
[Valerie Dascil](#).

[Department of Natural Resources and Parks](#)
[Water and Land Resources Division](#)

Updated: June 6, 2002

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School Resources

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4.1.2. Kitsap County

The following is from the Kitsap County, Washington webpage available at <http://www.kitsapgov.com/sswm/carwash.htm>.

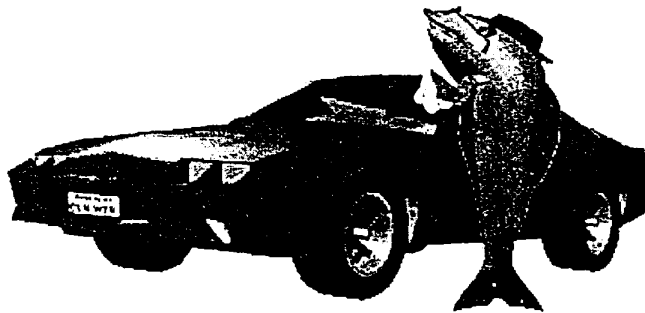
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Sound Car Wash



Protect our Water Quality--
and keep the fish alive



What's All The Fuss About?

Fund-raiser car washes are an important means by which youth organizations raise money. However, they can harm water quality. Detergents and other pollutants in the wash water are typically allowed to enter storm drains directly. Few people realize that water that enters storm drains goes directly to streams and eventually Puget Sound without ever getting treated. Untreated wash water can harm plants and animals which live in our streams, lakes, and Puget Sound. Besides harming the environment, this practice is illegal. In contrast, wash water from commercial car wash facilities is ultimately discharged to a sanitary sewer system and treated prior to discharge.

What is Sound Car Wash?

Kitsap County's Surface and Storm Water Management (SSWM) Program developed the Sound Car Wash program to loan out equipment FREE OF CHARGE that will help keep soapy, dirty wash water from going down the storm drain. The Bubble Buster is a porous boom attached to a vacuum which sucks the water away from the storm drain and pumps it to the sanitary sewer or a grassy area. The Drain Plug is built to be inserted into the storm drain to catch all the water before it goes down the drain. Then you put a sump pump inside, attach a hose to the pump, and pump the water to the sanitary sewer or a grassy area. These are called BMPs or Best

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Management Practices. Here are some other BMPs:

- Arrange to use a commercial car wash facility.
- Use hose nozzles that shut off automatically when unattended.
- Use a waterless car wash product.
- Avoid cleansers bearing the words "Caution", "Danger" or "Warning" on their labels.
- Avoid cleansers containing chlorine, chlorine bleach, phosphates, nitrates, and ammonia.
- Look for cleansers with low phosphates.
- Call the Washington Toxics coalition at (206)632-1545 for recommendations on brand name cleansers.
- Clean your engine only at commercial car wash facilities.

Site Requirements

To use the Bobble Buster or Drain Plug, you need to have the following at your site:

- A wash area which drains to a single storm drain located in a low-traffic zone.
- A water faucet within 100 feet of wash area.
- Electrical power within 100 feet of wash area.
- A pervious (grassy) area or sanitary sewer within 50 feet of wash area.

How Do We Get Started?

That's easy, just contact the Sound Car Wash Program at (360)337-5777 or (800)825-4940 or send e-mail to: carwash@co.kitsap.wa.us. We'll set up a day and time to meet with your group. We'll show you a short video and some of the equipment we have available. You provide the necessary car wash equipment (soap, buckets, sponges, brushes, hoses, etc.), and we'll help you plan an environmentally friendly car wash!

Businesses Can Help Too!

If you own or manage a business that hosts charity car washes, you can also help groups have environmentally friendly car washes. Contact the Sound Car Wash staff to discuss the options, view our new video, and pick up brochures about the Sound Car Wash Program.

Bubble Buster and Drain Plug

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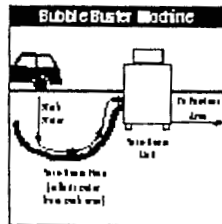


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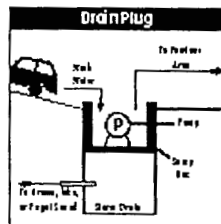
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1. Bubble Buster

The Bubble Buster (also known as Vacu-boom) wash water collection unit consists of a patented, porous boom connected to a heavy duty wet vacuum. After getting wet, the Bubble Buster seals itself against the pavement like a giant suction cup while forming an impervious barrier to water flow. Air and waste are rapidly vacuumed up! Then you can discharge the collected water, soap, etc. to a pervious area like grass or gravel. Call the Sound Car Wash Program to reserve a Bubble Buster machine.



2. Drain Plug

Wash water is collected in a sump box installed in a storm drain (be sure to measure the dimensions of the storm drain you will be using). The sump box is constructed of $\frac{3}{4}$ " plywood. Wash water from the sump box is routed to a gravel area, lawn, or sanitary sewer system using a $\frac{1}{4}$ -horsepower sump pump placed inside the sump box. Call the Sound Car Wash Program to reserve a Drain Plug or for plans to make one yourself.



Kitsap County Public Works
Surface & Storm Water Management Program
614 Division Street MS-26A
Port Orchard, WA 98366-4685
(360) 337-7290
(800) 825-4940
carwash@co.kitsap.wa.us

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4.2. Sample Ordinances

4.2.1. City of Santa Rosa

The following Ordinance is from the City of Santa Rosa, California and is available online at http://ci.santa-rosa.ca.us/pworks/Storm_water/storm_water_ordinance.asp. It is reproduced here as a representative example of a municipal storm water ordinance that complies with NPDES program requirements.

Chapter 17.12 STORM WATER

Sections:

- 17.12.00E Editor's note to Chapter 17.12.
- 17.12.00EA Article I. Drainage
 - 17.12.010 Specified acts--Permit required.
 - 17.12.015 Driveway culverts.
 - 17.12.020 Permit--Application--Issuance--Term.
 - 17.12.030 Permit--Security.
 - 17.12.040 Permit--Transferability.
 - 17.12.050 Inspection of work.
 - 17.12.060 Emergency work.
 - 17.12.070 Violation--Owner to terminate.
 - 17.12.080 Violation--Emergency abatement.
 - 17.12.090 Violation.
- 17.12.099A Article II. Storm Water Quality
 - 17.12.100 Purpose and intent of article.
 - 17.12.110 Definitions.
 - 17.12.120 Administrative authority.
 - 17.12.130 Construction and application.
 - 17.12.140 Discharge of non-storm water.
 - 17.12.150 Discharge in violation of NPDES permit.
 - 17.12.160 Unlawful discharge and unlawful connections.
 - 17.12.170 Reduction of pollutants in storm water.
 - 17.12.180 Enforcement.
 - 17.12.190 Violations constituting misdemeanors.
 - 17.12.200 Violation--Additional actions and remedies.
 - 17.12.210 Violation--Emergency abatement.
 - 17.12.220 Fine for falsification of data.
 - 17.12.230 Continuing violation.
 - 17.12.240 Concealment.
 - 17.12.250 Acts potentially resulting in violation of Federal Clean Water Act and/or Porter-Cologne Act.

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- 17.12.260 Violations deemed a public nuisance.
- 17.12.270 Civil actions.
- 17.12.280 Remedies not exclusive.
- 17.12.290 Dispute--Request for ruling.
- 17.12.300 Appeals.

Section 17.12.00E Editor's note to Chapter 17.12.

Section 17.12.015 Driveway culverts.

Driveway and private street culverts shall not cause a restriction of the flow of any adjoining street drainage system. The owners of property for which an appurtenant driveway or private street culvert causes, or contributes to, a restriction in flow of the adjoining street's drainage system shall, at their expense, maintain, clean or enlarge the existing culvert to the extent necessary to remove the restriction.

Section 17.12.020 Permit--Application--Issuance--Term.

(A) The written permits required by this article are:

- (1) Encroachment permits issued by the City Engineer/Director of Public Works for work on public property or public easements; and/or
- (2) Grading permits issued by the City Engineer/ Community Development for work done on public easements or property and certain private property or the Chief Building Official for work done on private property.

(B) The required permits may be issued for any lawful use, subject to the conditions set forth in this article and the permits. The issuance of a permit shall not imply or impute any responsibility of, or liability to the City for any injuries to persons or damages to property resulting from any act or work regulated by this article.

(C) Applications for permits shall be in writing and shall provide the appropriate City Engineer and/or the Chief Building Official with such information as requested and required in order that all engineering and other technical information may be available to the City Engineer or Chief Building Official as may be necessary to locate, delineate, illustrate, identify, justify and substantiate the proposed act or work, and the right and necessity of the applicant to perform the act or work. The City Engineer or Chief Building Official may require the applicant to submit soil investigations, tests of material, engineering plans and investigations and technical reports as he or she deems necessary and proper.

(D) The application shall be accomplished by the executed written consent and a release and waiver of liability as to, and as approved by the City, executed by all persons whose property would be affected in any manner by the act(s) or work to be performed.

(E) In issuing a permit, the appropriate City Engineer and/or the Chief Building Official may impose conditions reasonably necessary to safeguard the performance of the work and other properties which may be affected. A permit may be issued for any term up to one year. The

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original term may be extended by the City for a period not to exceed the length of the original term, upon the filing of a written application therefor prior to the permit's expiration, if good cause is shown.

Section 17.12.030 Permit--Security.

Any permit issued pursuant to this article may be issued subject to the condition(s) that until the permittee has entered into a written agreement with the City to perform the act or work in accordance with the terms of the permit and has posted security with the City in an amount satisfactory to the issuing City Engineer or the Chief Building Official, in a form satisfactory to the City Attorney, for the faithful performance of the act or work and/or assuring the payment of laborers and materialmen. The amount of each type of security which may be required shall not exceed 100 percent of the Engineer's or the Chief Building Official's estimate of the cost of the act or work to be performed and/or its removal or reconstruction in the event of a default on the part of the permittee.

Section 17.12.040 Permit--Transferability.

No permit issued under this article may be transferred or assigned to another person or entity without the prior written consent of the City. The City may condition any consent it gives.

Section 17.12.050 Inspection of work.

The City Engineer or Chief Building Official may inspect or cause to be inspected, from time to time, any act or work being done pursuant to a permit, and no permittee shall be deemed to have complied with this article until a final inspection of the work has been made by the issuing City Engineer or Chief Building Official and a report made in writing by the City Engineer or Chief Building Official that the work appears to have been completed in accordance with the permit. Unsatisfactory work shall be corrected or reconstructed by the permittee, and should the issuing City official determine the work is unsatisfactory due to lack of diligence or a willful act on the part of the permittee, that official may apply to the City Council for permission to contract with any licensed general contractor for the construction or completion of the act or work in conformance with the permit approval, or for the removal of the work, or portion thereof, which is nonconforming to the permit, and the cost thereof may be charged to the permittee upon the order of the City Council.

Section 17.12.060 Emergency work.

This article shall not prevent any person from performing emergency maintenance or work within, upon, over, under or through any watercourse, channel, ditch, conduit or natural storm water drainageway as may be necessary and proper for the preservation of life or property when an urgent necessity therefore arises. Any person performing such emergency work shall notify the Department of Public Works as soon as possible of performance of such work and he or she

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shall apply for a written permit for such work within 10 calendar days of the beginning of the work.

Section 17.12.070 Violation--Owner to terminate.

In addition to any other penalties or remedies provided by this article or by other law(s), the City Engineer or Chief Building Official may serve personally, or by certified mail, upon the owner of the property on which a violation of this article occurs, at the address of the property owner as it appears on the last equalized county assessment roll, a notice to abate the violation within 10 days after receipt of notice, and that if the owner fails to abate the violation within the time period, the City Engineer or Chief Building Official will cause the abatement thereof and that the cost of abatement may be charged to the property and to the owner thereof. If any such charge is not paid within 60 days of its billing to the property owner by the City, the amount of such charge may be placed as a lien on the property upon which the violation occurred and shall be collected in the manner fixed by law for the collection of special assessments; alternatively, the City may, at its option, recover the same in a civil action against the property and/or other person(s) responsible for the violation.

Section 17.12.080 Violation--Emergency abatement.

If the Director of Public Works finds that a violation of this article has created an emergency condition seriously endangering the public health or safety, the Director of Public Works may, with the approval of the City Manager, abate the condition without the written notice required by Section 17-12.070. The cost of such abatement will be charged to the owner of the property on which the violation occurs and/or any other person responsible for the violation and the City may, at its option, recover such costs in a civil action.

Section 17.12.090 Violation.

(A) Every person who violates any provision of this article is guilty of a misdemeanor.

(B) Every person who willfully violates any term, condition, or requirement of any permit required by this article is guilty of a misdemeanor.

Section 17.12.099A Article II. Storm Water Quality

Section 17.12.110 Definitions.

The following words and phrases when used in this article shall have the meanings as defined herein. Words and phrases used in this article and not otherwise defined shall be interpreted as defined in the regulations of the U.S. Environmental Protection Agency to implement the provisions of the Federal Clean Water Act and as defined by the State Water Resources Control Board to implement the Porter-Cologne Act in the State Water Code.

(A) "Authorized City employee(s)" means those individuals designated by the Director of Public Works to act as his or her designees.

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- (B) "Best management practices" or "BMP's" means schedules of activities, prohibitions or practices, general good housekeeping practices, pollution prevention practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to watercourses, water bodies, and wetlands. BMP's also include treatment requirements, operating procedures, design specifications, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.
- (C) "City's storm water system" means those publicly owned or maintained storm water facilities that are situated within the City.
- (D) "Commercial facility" means any nonresidential premises or any premises used as a site of commercial activity.
- (E) "Director of Public Works" means the Santa Rosa Director of Public Works or his or her designee.
- (F) "Discharge" means the flow of water and/or other materials to the storm water system from any distinguishable or identifiable source, other than from a vessel or other floating craft.
- (G) "Non-storm water discharge" means any discharge that is not entirely composed of storm water or any release of pollutants that potentially or actually discharges to the City's storm water system.
- (H) "Pollutant" means any material other than water.
- (I) "Pollutant loading" means the aggregate quantity of all pollutants.
- (J) "Polluted discharges" means those discharges whose pollutant load is such as to detract from or place limits on any actual or potential beneficial use of the receiving waters.
- (K) "Premises" means any building, lot, parcel, real estate, or land or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.
- (L) "Prohibited discharge" means any polluted discharge or any discharge to the City's storm water system that is not composed entirely of storm water, except discharges pursuant to a NPDES permit, discharges resulting from emergency fire fighting activities and discharges further exempted at Section 17-12.140(B)(2).
- (M) "Significant noncompliance" means noncompliance with any provision of this article that either:
- (1) Poses or threatens to pose a significant danger to the environment or public health;
 - (2) Has not been abated in a reasonable period of time; or
 - (3) Has recurred.
- (N) "Storm water" means storm water runoff, snow melt runoff, and surface water runoff and drainage.
- (O) "Storm water system" means those facilities by which storm water may be collected and conveyed to any stream, watercourse, other body of water or wetlands, publicly or privately owned which are not part of a Publicly Owned Treatment Works ("POTW") as that term is defined in 40 C.F.R. Section 122.2.

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(P) "Unpolluted discharges" means those discharges whose pollutant load does not detract from, or place limits on any actual or potential beneficial use of the receiving water.

Section 17.12.120 Administrative authority.

Except as otherwise provided in this code, the provisions of this article shall be administered by the Director of Public Works.

Section 17.12.130 Construction and application.

This article shall be construed in a manner which is consistent with the requirements of the Federal Clean Water Act and acts amendatory thereof, any applicable implementing regulations thereto and any NPDES Permit for storm water discharges from the Santa Rosa area issued by the State Water Resources Control Board or the North Coast Regional Water Quality Control Board and any amendment, revision or reissuance of the permit.

Section 17.12.140 Discharge of non-storm water.

(A) The release of non-storm water discharges to the City's storm water system is prohibited.

(B) The following discharges are exempt from the prohibition set forth in subsection (A) of this section:

(1) Any discharge in compliance with a National Pollution Discharge Elimination System (NPDES) permit issued to the discharger and administered by the State of California under the authority of the United States Environmental Protection Agency;

(2) Discharges from the following activities will not be considered a prohibited discharge to the City's storm water system when properly managed: flushing of potable water from potable water lines and other discharges from potable water sources, landscape irrigation and lawn watering, irrigation water, diverted stream flows, rising ground waters, uncontaminated ground water infiltration to storm drains, uncontaminated pumped ground water, foundation and footing drains, water from crawl space pumps, air conditioning condensation, springs, runoff from individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges or flows from emergency fire fighting, and other flows necessary for implementing BMPs directed or approved by the Director of Public Works.

Section 17.12.150 Discharge in violation of NPDES permit.

Any discharge that would result in, or contribute to, a violation of any NPDES permit for storm water discharges from the Santa Rosa area and any amendment, revision, or reissuance of such permit, either separately considered or when combined with other discharges, is prohibited. Liability for any such discharge shall be the responsibility of the person(s) causing or responsible for the discharge, and such persons shall defend, indemnify and hold harmless the City, its officers, agents and employees in any administrative or judicial enforcement action relating to such discharge.

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Section 17.12.160 Unlawful discharge and unlawful connections.

- (A) It is unlawful to establish, use, maintain or continue unauthorized drainage connections to the City's storm water system.
- (B) It is unlawful to establish, use, maintain or continue drainage connections to the City's storm water system which are or may be a source of prohibited discharges.
- (C) It is unlawful to commence or continue any unauthorized and/or prohibited discharges to the City's storm water system.

Section 17.12.170 Reduction of pollutants in storm water.

- (A) Activities Resulting in Discharge of Pollutants. Any person engaging in activities which may result in pollutants entering the City's storm water system shall undertake all practicable measures to reduce and/or eliminate such pollutants. All activities that do actually, or may potentially, result in the deposit of pollutants in or on the City's storm water system, in any tributary of this system, and all land which drains to either this system or any of its tributaries shall be construed as activities which may result in pollutants entering the City's storm water system. Examples of such activities include, but are not limited to, ownership and use of premises which may be a source of pollutants such as parking lots, gasoline stations, industrial facilities, business enterprises and dwelling units.
- (B) Pollutants and Littering. In addition to the prohibitions of Section 9-12.050, no person shall throw, deposit, leave, keep or permit to be thrown, deposited, placed, left or maintained, any refuse, household hazardous wastes or other hazardous wastes, garbage, debris, or other wastes, or other discarded or abandoned objects or articles in or upon any storm water system or upon any public or private plot of land in the City so that the same might become a pollutant, except in lawfully established waste disposal facilities.
- (C) Sidewalks. The occupant or tenant, or in the absence of occupant or tenant, the owner or proprietor of any real property in the City in front of which there is a paved sidewalk shall maintain that portion of the sidewalk in front of the property free of dirt or litter to the maximum extent practicable. Sweepings from the sidewalk shall not be swept or otherwise made or allowed to go into the gutter or roadway or any element of any drainage system, but shall be disposed of in receptacles maintained as required for the disposal of solid waste.
- (D) Construction Activities. Any construction contractor performing work in the City shall implement appropriate best management practices to prevent the discharge of construction wastes or debris or contaminants from construction materials, tools, and equipment from entering the storm water system.
- (E) Bodies of Water. No person shall throw or deposit litter in any fountain, pool, lake, stream, river or any other body of water in a park or elsewhere within the City.
- (F) Standard for Parking Lots, Paved Areas, and Related Storm Water Systems. Persons owning, operating, or maintaining a paved parking lot, the paved areas of a gas station, a paved private street, road, or driveway and related storm water systems shall clean those structures as

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frequently and thoroughly as practicable in a manner that does not result in discharge of pollutants to the storm water system.

(G) Notification of Intent and Compliance with General Permits. Each industrial discharger, discharger associated with construction activity or other discharger described in any general storm water permit addressing such discharges as may be adopted by the United States Environmental Protection Agency, the State Water Resources Control Board, or the California Regional Water Quality Control Board, North Coast Region, shall provide the notice of intent, comply with, and undertake all other activities required by any general storm water permit applicable to such dischargers, and shall provide a copy of the notice of intent and of each annual report pursuant to any general storm water permit to the Director of Public Works, and shall pay any associated monitoring and enforcement fees to the City that may be set by the City Council. Each discharger identified in an individual NPDES permit relating to storm water discharges shall comply with and undertake all activities required by such permit.

(H) Compliance with Best Management Practices. Where best management practice guidelines or requirements have been adopted or published by the Environmental Protection Agency, any State of California agency, any San Francisco Bay Area agency, or the City, for any activity, operation or facility which may cause or contribute to prohibited discharges, every person undertaking such activity or operation or owning or operating such commercial facility shall comply with such guideline or requirement.

(I) Storm water Pollution Prevention Plan. The Director of Public Works may require any business in the City that is engaged in activities which may result in prohibited discharges to develop and implement a storm water pollution prevention plan, which must include an employee training program. Business activities which may require a storm water pollution prevention plan include, but are not limited to, maintenance, storage, manufacturing, assembly, equipment operations, vehicle loading or fueling, or cleanup procedures which are carried out partially or wholly out of doors.

(J) Coordination with Hazardous Materials Release Response Plans and Inventory. Any business subject to the Hazardous Materials Release Response and Inventory Plan, Division 20, Chapter 6.95 of the California Health and Safety Code (commencing with Section 25500), shall include in that plan provision(s) for compliance with this article, including the prohibitions on non-storm water discharges and the requirement to reduce the release of pollutants to the maximum extent practicable.

Section 17.12.180 Enforcement.

(A) Inspections. Routine or area inspections by the City shall be based upon such reasonable selection process as may be deemed necessary to carry out the objectives of this article, including, but not limited to, random sampling and/or sampling in areas where there is evidence of storm water contamination, discharge of non-storm water to the storm water system, or similar activities. Such inspections may also be done in conjunction with routine inspections conducted

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by other public agencies such as the industrial waste section of the City's Utilities Department, the City's Fire Department or the County's Department of Health Services.

(B) Authority to Sample and Establish Sampling Devices. With the consent of the owner or the occupant of property or pursuant to a search or inspection warrant, any authorized City employee may take such samples and meter such discharges as the Director of Public Works deems necessary to determine whether a non-storm water discharge has taken place or is taking place and to determine the magnitude of such discharges. Such City employee may establish on any property such devices as are necessary to conduct sampling or metering operations. During all inspections as provided herein, the Director of Public Works may take any samples deemed necessary to aid in the pursuit of the inquiry or in the recordation of the activities on-site.

(C) Training of Employees--Notification of Spills. The owner of a commercial facility or the persons responsible for emergency response for a commercial facility have the responsibility to train facility personnel and maintain notification procedures to assure:

(1) Immediate notification is provided to the City Department of Public Works of any suspected, confirmed or unconfirmed release of material, pollutants or waste creating a risk of discharge into the City storm water system;

(2) Immediate notification is given to the "911" emergency response system if said discharge poses an immediate threat to the public health or safety and/or the environment;

(3) Written notification is provided to the Director of Public Works within five working days.

(a) Training of personnel shall assure that all BMPs are being fully and correctly implemented and that all releases of any non-storm water discharge or of any pollutant that threatens to enter the City's storm water system are immediately recognized and that appropriate response is taken in the event of such release.

(b) As soon as any person in charge of a commercial facility or who is responsible for emergency response for a commercial facility has knowledge of, or reasonably could be expected to have knowledge of, any suspected, confirmed or unconfirmed release of a non-storm water discharge entering, or of any pollutant that is threatening to enter, the City storm water system from such facility, such person shall take all necessary steps to ensure the early discovery and containment and clean up such release and shall immediately notify the City Department of Public Works. In addition, written notification shall be given to the Director of Public Works within five working days. This written notification shall contain as a minimum a narrative describing the circumstances resulting in the release, or threatened release, the effort taken to clean up the release and the measures being taken to prevent reoccurrence. This notification requirement is in addition to, and not in lieu of, other required notifications.

(D) Requirement to Test or Monitor. Any authorized City employee may require that any person engaged in any activity or owning or operating any commercial facility which may cause or contribute to illicit discharges, undertake such monitoring activities and/or analysis and furnish such reports as the authorized employee may specify. The burden, including costs, of these activities, analysis and reports shall bear a reasonable relationship to the need for the monitoring

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and/or analysis and reports and the benefits to be obtained. The recipient of such a requirement shall undertake and provide the monitoring, analysis and reports required.

(E) Order to Cease and Desist. When the Director of Public Works finds that the discharge from a commercial facility is taking place, or is threatening to take place, in violation of the prohibitions of this article or any other discharge control requirements, the Director of Public Works may issue a written order to cease and desist and may direct the discharger to:

(1) Comply forthwith with the order and to cease those operations which result or threaten to result in discharges which violate any prohibition or limit of this article until such time as the Director states in writing that he or she is satisfied that BMPs which will remove the threat are in place;

(2) Comply with the order in accordance with a time schedule set by the Director; or

(3) In the event of a threatened violation take appropriate remedial or preventive action.

(F) Require that the Discharger Submit a Schedule of Remedial or Preventive Action. When the Director of Public Works finds that the discharge from a commercial facility is taking place, or is threatening to take place, in violation of the prohibitions of this article or any other discharge control requirements, the Director of Public Works may issue an order to cease and desist and may direct the discharger to submit for her or his approval a detailed time schedule of specific actions the discharger shall take to correct or prevent the violation of such prohibitions and requirements.

(G) PredischARGE Facility. When source reduction BMPs are in the opinion of the Director of Public Works inadequate to prevent actual or potential prohibited discharges from a commercial facility to the City's storm water system, the Director of Public Works may require that the owner of the commercial facility shall provide, at the owner's expense, such predischARGE facilities as may be necessary to reduce the pollutant load at a point prior to discharge from said facility or to any element of the City's storm water system. The Director of Public Works may further require that the owner of the commercial facility, at the owner's expense, provide a monitoring access hole so that the pollutant loading may be periodically measured. Examples of predischARGE facilities are oil/grease interceptors and sand/silt interceptors.

Plans, specifications, and other pertinent factors related to the aforementioned predischARGE facilities shall be submitted to the City for approval by the Director of Public Works. Construction of the proposed facilities shall not commence until the Director's approval is obtained in writing and use of the facilities shall not commence until the completed facilities are approved in writing by the Director. Such facilities, once approved, shall be continuously maintained in satisfactory operating condition to the satisfaction of the Director of Public Works.

Section 17.12.190 Violations constituting misdemeanors.

The violation of any provision of this article, or the failure to comply with any of the mandatory requirements of this article shall constitute a misdemeanor.

Section 17.12.200 Violation--Additional actions and remedies.

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(A) Any non-storm water discharger found to be in significant noncompliance as defined in Section 17-12.110 in any calendar year may have its name published in the largest daily newspaper published in the Santa Rosa area.

(B) Any person who violates any order issued by the Director of Public Works for violation of the provisions of this article regulating or prohibiting discharge of non-storm water and which causes, or threatens to cause, non-storm waters to enter the City's storm water system may be liable civilly in a sum not to exceed the amount that the City may be fined by the State Water Resources Control Board or the amount of any civil liability imposed on the City for noncompliance with the municipal storm water discharge permit for the Santa Rosa area.

Section 17.12.210 Violation--Emergency abatement.

If the Director of Public Works determines that a violation of this article has created an emergency condition which seriously endangers the public health or safety, the Director of Public Works may abate the condition. The cost of said abatement shall be charged to the discharger and the City may at its option recover the same in a civil action. Such charge shall be in addition to any penalty for a violation of the article under Sections 1712.190 or 17-12.200(B) of this article.

Section 17.12.220 Fine for falsification of data.

Any person who submits a report required by this article, which she or he knows, or should have reason to know, contains falsified data shall be subject to a fine not to exceed the amount that the City may be fined by the State Water Resources Control Board or the amount of any civil liability imposed on the City for noncompliance with the municipal storm water discharge permit for the Santa Rosa area.

Section 17.12.230 Continuing violation.

Every day or any portion thereof any violation of this article continues shall constitute a separate offense.

Section 17.12.240 Concealment.

Concealing, aiding, or abetting a violation of any provision of this article shall constitute a violation of such provision.

Section 17.12.250 Acts potentially resulting in violation of Federal Clean Water Act and/or Porter-Cologne Act.

Any person who violates any provision of this article or who violates any cease and desist order or prohibition may also be in violation of the Federal Clean Water Act and/or the Porter-Cologne Act and may be subject to the sanction of those acts including civil and criminal penalties. Any enforcement actions authorized under this article may also include notice to the violator of such potential liability.

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Section 17.12.260 Violations deemed a public nuisance.

In addition to the penalties provided herein, the City Council finds and determines that any condition caused or permitted to exist in violation of any of the provisions of this article is a threat to the public health, safety and welfare, is declared to be a nuisance and may be abated as such.

Section 17.12.270 Civil actions.

In addition to any other remedies provided in this article, any violation of this article may be enforced by civil action brought by the City. In any such action, the City may seek, as appropriate, any or all of the following:

- (A) A temporary restraining order, preliminary and permanent injunction;
- (B) Reimbursement for the costs of any investigation, inspection, or monitoring survey which led to the establishment of the violation, and for the reasonable costs of preparing and bringing administrative action under this article;
- (C) Costs incurred in removing, correcting, or terminating the adverse effect resulting from the violation;
- (D) Compensatory damages for loss or destruction of water quality, wildlife, fish and aquatic life.

Costs and damages recovered under this section shall be paid to the City and shall be used exclusively for costs associated with monitoring and establishing storm water discharge pollution control system(s) and implementing or enforcing the provisions of this article.

Section 17.12.280 Remedies not exclusive.

The remedies identified in this article are in addition to and do not supersede or limit any and all other remedies, civil or criminal. The remedies provided in this article shall be cumulative and not exclusive.

Section 17.12.290 Dispute--Request for ruling.

If any discharger disputes an interpretation or application of this article, the discharger may request in writing a ruling by the Director of Public Works on the matter. The Director will set forth his or her determination(s) in writing.

Section 17.12.300 Appeals.

If the discharger is dissatisfied with the determinations made by the Director of Public Works under Section 17-12.290, the discharger may, within 30 days after receipt of the ruling by the Director of Public Works, appeal the ruling to the City Council by filing a written notice of appeal with the City Clerk. The notice shall state each basis and the grounds for the appeal. The Council shall make a final determination of the issue(s) so submitted.

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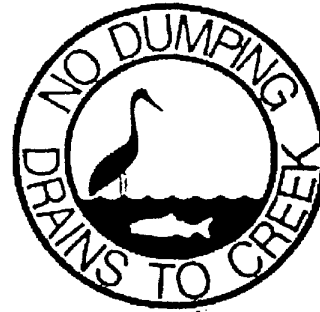
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4.2.1. EPA Erosion and Sediment Control Model Ordinance

The following sample ordinance is from the EPA Phase II NPDES model ordinance webpage and is available online at <http://www.epa.gov/nps/ordinance/mol2.htm#sec1>.

Erosion and Sediment Control Model Ordinance

Section I. Introduction/ Purpose

During the construction process, soil is highly vulnerable to erosion by wind and water. Eroded soil endangers water resources by reducing water quality and causing the siltation of aquatic habitat for fish and other desirable species. Eroded soil also necessitates repair of sewers and ditches and the dredging of lakes. In addition, clearing and grading during construction cause the loss of native vegetation necessary for terrestrial and aquatic habitat.

As a result, the purpose of this local regulation is to safeguard persons, protect property, and prevent damage to the environment in _____ (*municipality*). This ordinance will also promote the public welfare by guiding, regulating, and controlling the design, construction, use, and maintenance of any development or other activity that disturbs or breaks the topsoil or results in the movement of earth on land in _____ (*municipality*).

Section II. Definitions

Certified Contractor A person who has received training and is licensed by _____ (*state or local environmental agency*) to inspect and maintain erosion and sediment control practices.

Clearing Any activity that removes the vegetative surface cover.

Drainage Way Any channel that conveys surface runoff throughout the site.

Erosion Control A measure that prevents erosion.

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Erosion and Sediment Control Plan	A set of plans prepared by or under the direction of a licensed professional engineer indicating the specific measures and sequencing to be used to control sediment and erosion on a development site during and after construction.
Grading	Excavation or fill of material, including the resulting conditions thereof.
Perimeter Control	A barrier that prevents sediment from leaving a site by filtering sediment-laden runoff or diverting it to a sediment trap or basin.
Phasing	Clearing a parcel of land in distinct phases, with the stabilization of each phase completed before the clearing of the next.
Sediment Control	Measures that prevent eroded sediment from leaving the site.
Site	A parcel of land or a contiguous combination thereof, where grading work is performed as a single unified operation.
Site Development Permit	A permit issued by the municipality for the construction or alteration of ground improvements and structures for the control of erosion, runoff, and grading.
Stabilization	The use of practices that prevent exposed soil from eroding.
Start of Construction	The first land-disturbing activity associated with a development, including land preparation such as clearing, grading, and filling; installation of streets and walkways; excavation for basements, footings, piers, or foundations; erection of temporary forms; and installation of accessory buildings such as garages.
Watercourse	Any body of water, including, but not limited to lakes, ponds, rivers, streams, and bodies of water delineated by _____ (<i>municipality</i>).
Waterway	A channel that directs surface runoff to a watercourse or to the public storm drain.

Section III. Permits

- A) No person shall be granted a site development permit for land-disturbing activity that would require the uncovering of *10,000 or more square feet* without the approval of an Erosion and Sediment Control Plan by _____ (*erosion and sediment control agency*).

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The size of the site regulated under the erosion and sediment control ordinance varies widely. The proposed Phase II of USEPA's National Pollutant Discharge Elimination System (NPDES) rules regulates disturbances greater than 1 acre, but communities may regulate sites as small as 2,000 square feet.

B) No site development permit is required for the following activities:

- 1) Any emergency activity that is immediately necessary for the protection of life, property, or natural resources.
- 2) Existing nursery and agricultural operations conducted as a permitted main or accessory use.



Communities may choose to exempt other activities, such as mining, from an erosion and sediment control permit, or in some cases include the exempted uses cited above.

- 2) Each application shall bear the name(s) and address(es) of the owner or developer of the site, and of any consulting firm retained by the applicant together with the name of the applicant's principal contact at such firm and shall be accompanied by a filing fee.
- 3) Each application shall include a statement that any land clearing, construction, or development involving the movement of earth shall be in accordance with the Erosion and Sediment Control Plan and that a certified contractor shall be on site on all days when construction or grading activity takes place.



Some states have "Certified Contractor" programs, in which contractors successfully complete a training course in basic erosion and sediment control. This person would be responsible for ensuring the regular maintenance and proper installation of erosion and sediment control measures.

- 4) The applicant will be required to file with _____ (municipality) a faithful performance bond, letter of credit, or other improvement security in an amount deemed sufficient by _____ (erosion and sediment control agency) to cover all costs of improvements, landscaping, maintenance of improvements for such period as specified by _____ (municipality), and engineering and inspection costs to cover the cost of failure or repair of improvements installed on the site.

Section IV. Review and approval

- 1) _____ (erosion and sediment control agency) will review each application for a site development permit to determine its conformance with the provisions of this regulation. Within 30 days after receiving an application, _____ (erosion and sediment control agency) shall, in writing:

- 1) Approve the permit application;
- 2) Approve the permit application subject to such reasonable conditions as may be

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necessary to secure substantially the objectives of this regulation, and issue the permit subject to these conditions; or

- 3) Disapprove the permit application, indicating the reason(s) and procedure for submitting a revised application and/or submission.
- 2) Failure of the _____ (*erosion and sediment control agency*) to act on an original or revised application within 30 days of receipt shall authorize the applicant to proceed in accordance with the plans as filed unless such time is extended by agreement between the applicant and _____ (*erosion and sediment control agency*). Pending preparation and approval of a revised plan, development activities shall be allowed to proceed in accordance with conditions established by _____ (*erosion and sediment control agency*).

Section V. Erosion and Sediment Control Plan

A) The Erosion and Sediment Control Plan shall include the following:

- 1) A natural resources map identifying soils, forest cover, and resources protected under other chapters of this code.



This map should be at a scale no smaller than 1"=100'. For a more detailed discussion, see the buffer ordinance.

- 2) A sequence of construction of the development site, including stripping and clearing; rough grading; construction of utilities, infrastructure, and buildings; and final grading and landscaping. Sequencing shall identify the expected date on which clearing will begin, the estimated duration of exposure of cleared areas, areas of clearing, installation of temporary erosion and sediment control measures, and establishment of permanent vegetation.
 - 3) All erosion and sediment control measures necessary to meet the objectives of this local regulation throughout all phases of construction and after completion of development of the site. Depending upon the complexity of the project, the drafting of intermediate plans may be required at the close of each season.
 - 4) Seeding mixtures and rates, types of sod, method of seedbed preparation, expected seeding dates, type and rate of lime and fertilizer application, and kind and quantity of mulching for both temporary and permanent vegetative control measures.
 - 5) Provisions for maintenance of control facilities, including easements and estimates of the cost of maintenance.
- 2) Modifications to the plan shall be processed and approved or disapproved in the same manner as Section IV of this regulation, may be authorized by _____ (*erosion and sediment control agency*) by written authorization to the permittee, and shall include
- 1) Major amendments of the erosion and sediment control plan submitted to _____ (*erosion and sediment control agency*)
 - 1) Field modifications of a minor nature

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Section VI. Design Requirements

- 1) Grading, erosion control practices, sediment control practices, and waterway crossings shall meet the design criteria set forth in the most recent version of _____ (*erosion and sediment control manual*), and shall be adequate to prevent transportation of sediment from the site to the satisfaction of _____ (*erosion and sediment control agency*). Cut and fill slopes shall be *no greater than 2:1*, except as approved by _____ (*erosion and sediment control agency*) to meet other community or environmental objectives.
 - B) Clearing and grading of natural resources, such as forests and wetlands, shall not be permitted, except when in compliance with all other chapters of this Code. Clearing techniques that retain natural vegetation and drainage patterns, as described in _____ (*erosion and sediment control manual*), shall be used to the satisfaction of _____ (*erosion and sediment control agency*).
- 2) Clearing, except that necessary to establish sediment control devices, shall not begin until all sediment control devices have been installed and have been stabilized.

☞ For example, the stream buffer codes as well as the forest conservation code in the "Miscellaneous Ordinances" section would also restrict clearing.
- 3) Phasing shall be required on all sites disturbing greater than 30 acres, with the size of each phase to be established at plan review and as approved by _____ (*erosion and sediment control agency*).

☞ Although many communities encourage phasing, few actually require it. Phasing construction can reduce erosion significantly when well designed. (See Claytor, 1997.)
- 4) Erosion control requirements shall include the following:
 - 1) Soil stabilization shall be completed within *five days* of clearing or inactivity in construction.
 - 2) If seeding or another vegetative erosion control method is used, it shall become established within *two weeks* or _____ (*erosion and sediment control agency*) may require the site to be reseeded or a nonvegetative option employed.

☞ Numerical standards regarding the time to stabilization will vary. In particular, the time to establish seeding will depend on the climate.
- 3) Special techniques that meet the design criteria outlined in _____ (*erosion and sediment control manual*) on steep slopes or in drainage ways shall be used to ensure stabilization.
- 4) Soil stockpiles must be stabilized or covered at the end of each workday.
- 5) The entire site must be stabilized, using a heavy mulch layer or another method that does not require germination to control erosion, at the close of the construction season.

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DRAFT – TECHNICAL MEMORANDUM No. 3



Goals and Objectives of Storm water Management Plan
City of Lodi Storm water Master Plan and
Phase II NPDES Permit

B&V PN: 131547.0300
07/29/02

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- 6) Techniques shall be employed to prevent the blowing of dust or sediment from the site.
 *Dust control is most important in arid regions of the country*
- 7) Techniques that divert upland runoff past disturbed slopes shall be employed.
- 4) Sediment controls requirements shall include
 - 1) Settling basins, sediment traps, or tanks and perimeter controls.
 - 2) Settling basins that are designed in a manner that allows adaptation to provide long term storm water management, if required by _____ (*erosion and sediment control agency*)
- 3) Protection for adjacent properties by the use of a vegetated buffer strip in combination with perimeter controls
- 5) Waterway and watercourse protection requirements shall include
 - 1) A temporary stream crossing installed and approved by _____ (*approving agency, e.g., Waterways Division, ESC agency*) if a wet watercourse will be crossed regularly during construction
 - 1) Stabilization of the watercourse channel before, during, and after any in-channel work
 - 2) All on-site storm water conveyance channels designed according to the criteria outlined in _____ (*erosion and sediment control manual*)
 - 3) Stabilization adequate to prevent erosion located at the outlets of all pipes and paved channels
- F) Construction site access requirements shall include
 - 1) a temporary access road provided at all sites
 - 2) other measures required by _____ (*erosion and sediment control agency*) in order to ensure that sediment is not tracked onto public streets by construction vehicles or washed into storm drains

Section VII. Inspection

- 2) _____ (*erosion and sediment control agency*) or designated agent shall make inspections as hereinafter required and either shall approve that portion of the work completed or shall notify the permittee wherein the work fails to comply with the Erosion and Sediment Control Plan as approved. Plans for grading, stripping, excavating, and filling work bearing the stamp of approval of the _____ (*erosion and sediment control agency*) shall be maintained at the site during the progress of the work. To obtain inspections, the permittee shall notify _____ (*erosion and sediment control agency*) at least two working days before the following:
 - 1) Start of construction
 - 2) Installation of sediment and erosion measures
 - 3) Completion of site clearing

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- 4) Completion of rough grading
- 5) Completion of final grading
- 6) Close of the construction season
- 7) Completion of final landscaping



The "Certified Inspector Program" in Delaware allows developers to hire an inspector who has passed a state licensing program. This person would inspect the site at regular intervals and file reports to the erosion and sediment control agency. The agency would then be responsible for spot checks on these reports.

- 3) The permittee or his/her agent shall make regular inspections of all control measures in accordance with the inspection schedule outlined on the approved Erosion and Sediment Control Plan(s). The purpose of such inspections will be to determine the overall effectiveness of the control plan and the need for additional control measures. All inspections shall be documented in written form and submitted to _____ (erosion and sediment control agency) at the time interval specified in the approved permit.
- 4) _____ (erosion and sediment control agency) or its designated agent shall enter the property of the applicant as deemed necessary to make regular inspections to ensure the validity of the reports filed under Section B.

Section VIII. Enforcement

1) Stop-Work Order; Revocation of Permit

In the event that any person holding a site development permit pursuant to this ordinance violates the terms of the permit or implements site development in such a manner as to materially adversely affect the health, welfare, or safety of persons residing or working in the neighborhood or development site so as to be materially detrimental to the public welfare or injurious to property or improvements in the neighborhood, _____ (erosion and sediment control agency) may suspend or revoke the site development permit.

A) Violation and Penalties

No person shall construct, enlarge, alter, repair, or maintain any grading, excavation, or fill, or cause the same to be done, contrary to or in violation of any terms of this ordinance. Any person violating any of the provisions of this ordinance shall be deemed guilty of a misdemeanor and each day during which any violation of any of the provisions of this ordinance is committed, continued, or permitted, shall constitute a separate offense. Upon conviction of any such violation, such person, partnership, or corporation shall be punished by a fine of not more than \$_____ for each offense. In addition to any other penalty authorized by this section, any person, partnership, or corporation convicted of violating any of the provisions of this ordinance shall be required to bear the expense of such restoration.

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Specific penalties will vary between communities and should reflect enforceable penalties given the political realities of a jurisdiction.

Section IX. Separability

The provisions and sections of this ordinance shall be deemed to be separable, and the invalidity of any portion of this ordinance shall not affect the validity of the remainder.

References

Claytor, R. 1997. Practical Tips for Construction Site Phasing. *Watershed Protection Techniques* 2(3): 413-417.

4.3. Sample Inlet Protection Schemes

4.3.1. City of Houston, Harris County and Harris County Flood Control District

The following sample inlet protection information is from the City of Houston, Harris County and Harris County Flood Control District's Storm Water Management Handbook for Construction Activities available on the Internet at <http://www.cleanwaterclearchoice.org/downloads.html>.

4.5 BEST MANAGEMENT PRACTICES FOR PROTECTING INLETS

Because the best management practices to minimize the movement of pollutants from the site can never be 100% effective, there remains a need to prevent pollutants from entering inlets, catch basins, culverts and other conveyance structures to prevent pollutants from reaching receiving waters.

All storm sewer inlets that are made operable during construction should be protected so that storm water runoff will not enter without first being filtered or otherwise treated to remove sediment. It is not practical to control drainage areas larger than one acre with this measure alone. Erosion control on the exposed land is also needed to limit the sediment movement. The measure should be left in place until adequate cover is established.

It is critical that storm sewer inlets not be completely blocked. Blocking an inlet can cause streets to flood, sediment to build up and become a hazard, and public safety may be impaired.

Best management practices include:

Inlet protection barriers (Section 4.5.1)

Drop inlet insert basket (Section 4.5.2)

Storm inlet sediment trap (Section 4.5.3)

4.5.1 Inlet Protection Barriers

A. Definition

An inlet protection barrier is a temporary barrier constructed around a storm drain inlet, catch basin or culvert.

B. Purpose

To prevent sediment and other pollutants from entering conveyance systems.

C. Conditions Where Practice Applies

At the location where runoff enters conveyance system structures such as curb inlets, drop inlets and culverts.

D. Planning Considerations

This best management practice uses many of the design criteria and requirements of Section 4.3.1 Reinforced Filter Fabric Barriers and Section 4.2.2 Straw Bale Fences.

E. Design Criteria and Requirements

<i>Timing</i>	The inlet protection barrier should be installed before the drainage area is disturbed.
<i>Removal</i>	The inlet protection barrier shall remain in place and be maintained until the disturbed area is stabilized by permanent best management practices.
<i>Placement</i>	The inlet protection barrier shall surround the inlet. Where the elevation of curbs or adjacent ground surfaces are higher than the top of the inlet structure, a storm inlet sediment trap may be used as discussed in Section 4.5.3.

Stage I inlet protection barriers on soil

Reinforced filter fabric barriers and straw bale fences constructed on soil shall meet the following requirements:

Reinforced Filter fabric barrier	The design criteria and requirements and maintenance requirements contained in Section 4.3.1 shall be used for all reinforced filter fabric barriers used for Stage I inlet protection with the posts located at all corners or approximately every 90 degrees and beams to connect the posts.
Straw bale fence	The design criteria and requirements and maintenance requirements contained in Section 4.2.2 shall be used for all straw bale fences used for inlet protection with the posts located at all corners or approximately every 90 degrees and beams to connect the posts.

Stage I inlet protection barriers on paved surfaces

Reinforced filter fabric barriers on paved surface shall be constructed to meet the design criteria and requirements and maintenance requirements contained in Section 4.3.1 except for the following:

- a. Support for the filter fabric shall be provided by a heavy gauge welded fence, or 2 or 3 layers of 8-inch cement blocks.
- b. The filter fabric shall extend outward away from the reinforced filter fabric barrier along the pavement for at least 12 inches and be covered with at least 4 inches of gravel or nylon gravel-filled bags.
- c. The filter fabric shall be wired to the welded support structure or cement blocks or weighted down by an additional layer of cement blocks.

Straw bale fences	Straw bale fence on paved surface shall be constructed to meet the design criteria and requirements contained in Section 4.2.2, except that the bales can be weighted down with sandbags in lieu of rebar stakes.
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Stage II inlet protection barriers on paved surfaces

Protection for Stage II inlets with completed pavement surfaces can also be provided by one of the following methods.

- a. Straw bales weighted down by sandbags, constructed in accordance with Section 4.2.2 can be placed in the gutter on each side of a curb inlet to filter runoff and cause sedimentation in the gutter and along the back-end.
- b. Sandbags, constructed in accordance with Section 4.3.4, can be placed in the gutter on each side along the back-end of a curb inlet

to pond water and cause sedimentation in the gutter.

F. Inspection and Maintenance

1. Inlet protection barriers should be inspected within 24 hours after each rainfall of 0.5 inches or greater; daily during periods of prolonged rainfall; and at least once a week. Repair or replacement should be made immediately.
2. Sediment deposits should be removed after each storm event and no later than at such time as deposits reach one-third the height of the fence or barrier.

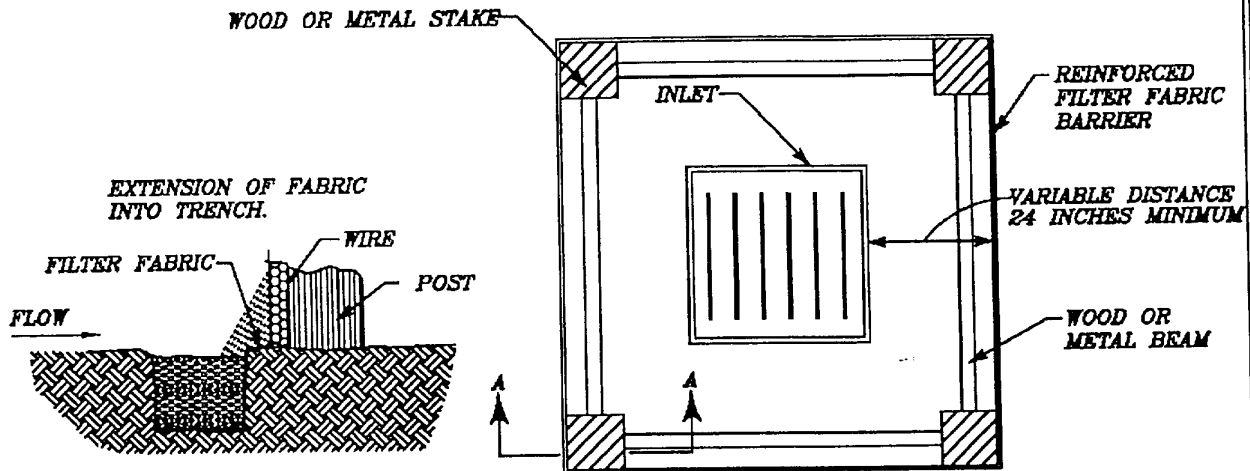
G. Corresponding Technical Specification (Refer to Appendix C)

Item No. 4511 Inlet Protection Barriers

INLET PROTECTION BARRIER

(FOR STAGE I INLETS)

REINFORCED FILTER FABRIC BARRIER

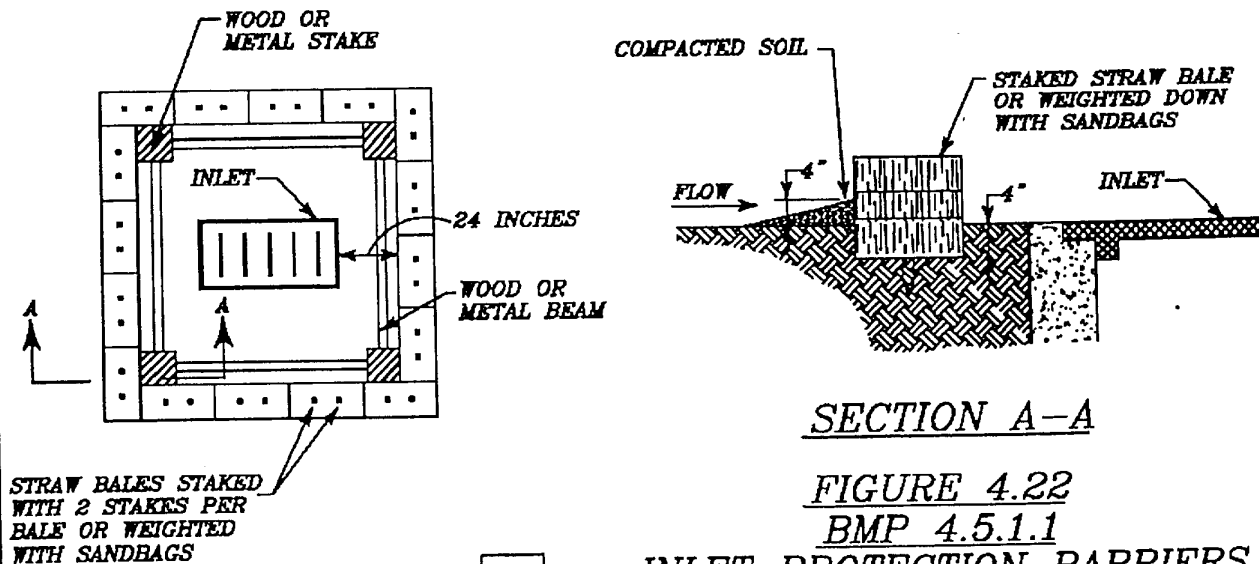


SECTION A-A

PLAN

SEE FIGURE 4.15 FOR REINFORCED FILTER FABRIC BARRIER REQUIREMENTS

STRAW BALE



SECTION A-A

FIGURE 4.22

BMP 4.5.1.1

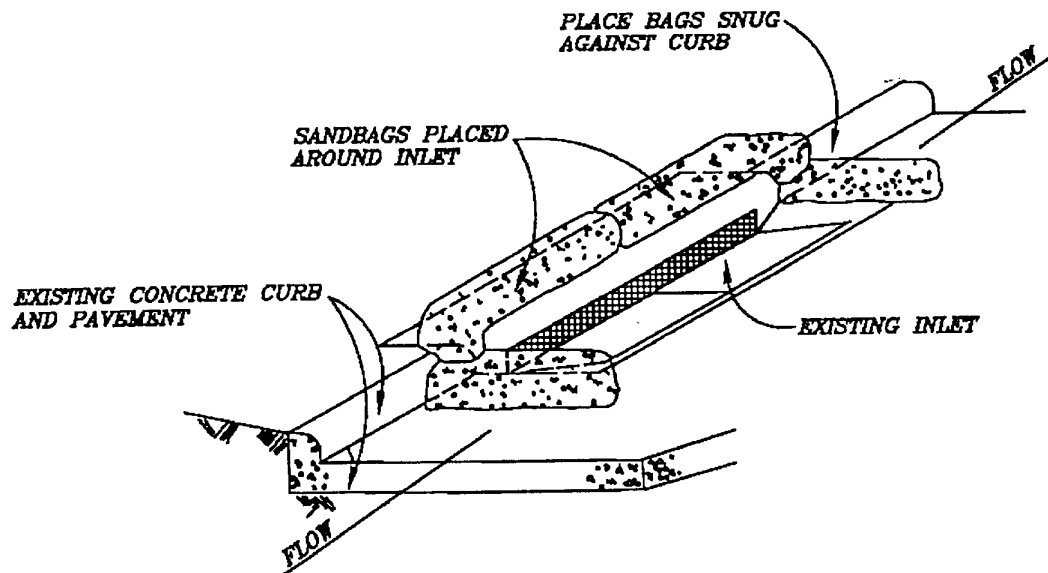
INLET PROTECTION BARRIERS
FOR STAGE I INLETS

PLAN

IPB

SYMBOL

INLET PROTECTION BARRIER (FOR STAGE II INLETS)



SEE SECTION 4.3.4 FOR SANDBAG DESIGN
AND MAINTENANCE REQUIREMENTS

IPB
SYMBOL

FIGURE 4.23
BMP 4.5.1.2
INLET PROTECTION
BARRIERS FOR
STAGE II INLETS

4.5.2 Drop Inlet Insert Basket

A. Definition

A drop inlet insert basket is a temporary barrier placed within a storm drain inlet consisting of a filter fabric supported by a metal framework.

B. Purpose

To prevent sediment and other pollutants from entering conveyance systems.

C. Conditions Where Practice Applies

1. At the location where runoff enters conveyance system structures such as drop inlets.
2. Where the disturbed area within the drainage area is less than 0.25 acres per inlet.

D. Planning Considerations

This method has been developed to provide a barrier where a barrier surrounding the inlet is not practical or safe.

E. Design Criteria and Requirements

Timing The drop inlet insert basket or equivalent measure should be installed before the drainage area is disturbed. An inlet insert basket can be used after upper portion (Stage II) construction of drop inlets to replace another measure used to protect the lower portion (Stage I) drop inlet.

Removal The inlet insert basket should remain in place and be maintained until the disturbed area is stabilized by permanent best management practices.

Placement The inlet insert basket should fit into the drop inlet without gaps around the insert.

Basket Design

The support for the inlet insert basket should consist of fabricated metal as illustrated in the drawings. The basket shall be approximately 14 inches in depth.

The top frame of the basket shall be constructed with two short sides of 2-inch x 2-inch and a single long side of 1-inch x 1-inch, 1/8-inch angle iron.

The basket hangers shall be constructed of 2-inch x 1/4-inch iron bars.

The bottom frame shall be constructed of 1-inch x 1/4-inch iron bar of 1/4-inch plate with center 3 inches removed.

The sides of the inlet basket shall be a minimum 1/4-inch diameter iron rods or equivalent. A minimum of 14 rods shall be welded in place between the top frame/basket hanger and the bottom frame.

Fabric Placement

The filter fabric shall be pushed down and formed to the shape of the basket. The sheet of fabric shall be large enough to be supported by the basket frame when holding sediment and extend at least 6 inches past the frame. The inlet grate shall be placed over the basket/frame to serve as a fabric anchor.

Fabric Specifications

The filter fabric shall meet the following specifications:

Grab strength: 100 lb. minimum in any principal direction
(ASTM D4632)

Puncture Strength: Minimum 200 psi (ASTM D4833)

The fabric shall have an opening such that 15% by weight of soils will pass through.

Water Flow Rate Approximately 120 gal/min/ft²

Ultraviolet Ray Inhibitors and Stabilizers Should provide an expected useable life comparable to the anticipated construction construction period, at least 50% after 500 hours (ASTM D4355).

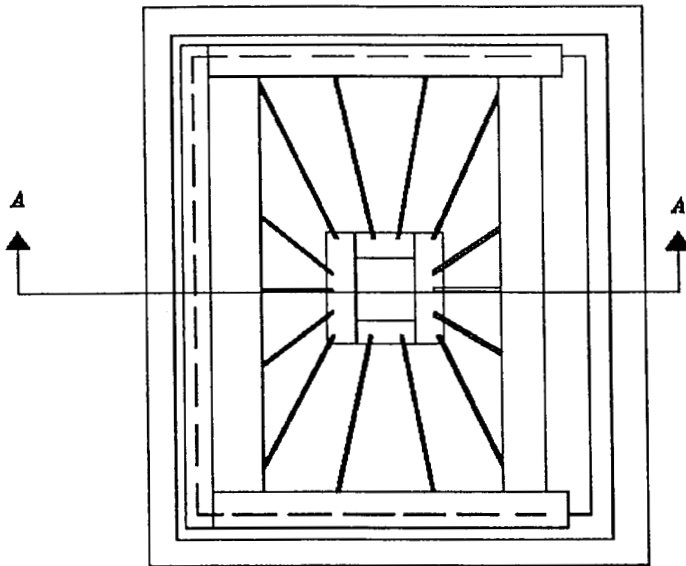
F. Inspection and Maintenance

1. Drop inlet insert baskets should be inspected within 24 hours after each rainfall of 0.5 inches or greater, or daily during periods of prolonged rainfall; and at a minimum at least once a week. Repair or replacement should be made immediately.
2. Sediment deposits should be removed after each storm event and no later than at such time as deposits reach one third the depth of the basket.

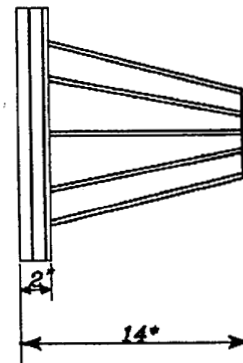
G. Corresponding Technical Specification (Refer to Appendix C)

Item No. 4521 Drop Inlet Insert Baskets

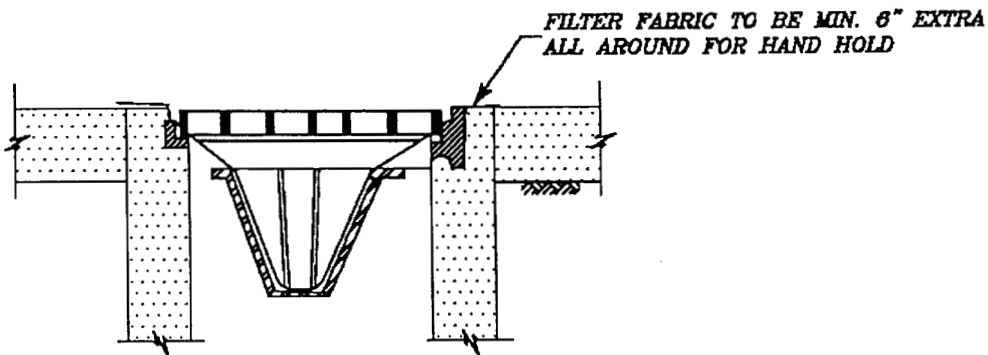
DROP INLET INSERT BASKET



PLAN
(WITH FILTER FABRIC AND
GRATE REMOVED)



SIDE VIEW
(BASKET ONLY)
MAY BE DECREASED IF INLET
IS OF INSUFFICIENT DEPTH.



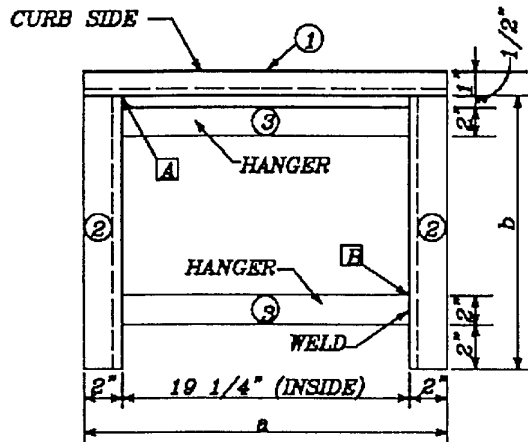
SECTION A-A

DIB

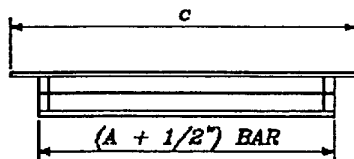
SYMBOL

FIGURE 4.24a
BMP 4.5.2.1
DROP INLET INSERT BASKET
DRAWING A

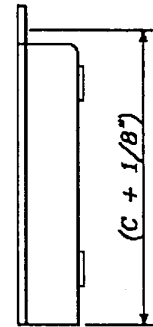
DROP INLET INSERT BASKET



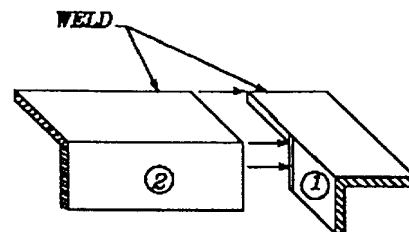
PLAN



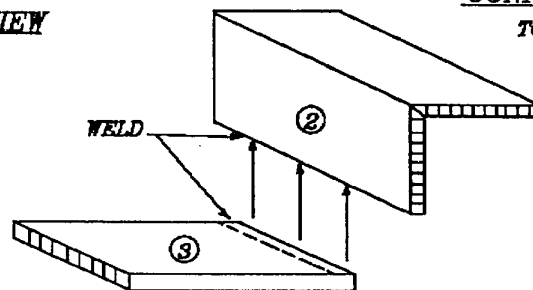
FRONT VIEW



SIDE VIEW



CONNECTION - A
TOP FRAME



CONNECTION - B
BASKET HANGER
TO TOP FRAME

*LENGTH AS NECESSARY TO
FIT AREA STORM SEWER INLET
TYPE TO BE PROTECTED.

BAR SCHEDULE

NO.	SNAPS	SIZE	THICKNESS	LENGTH*	QUANTITY
1	ANGLE	1"x1"	1/8"	a	1
2	ANGLE	2"x2"	1/8"	b	2
3	BAR	2"	1/4"	c	2

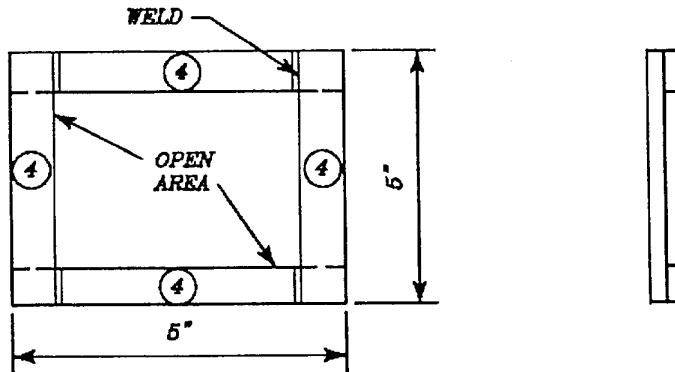
DIB

SYMBOL

FIGURE 4.24b
BMP 4.5.2.1 (CONT.)
DROP INLET
INSERT BASKET
DRAWING B

DROP INLET INSERT BASKET

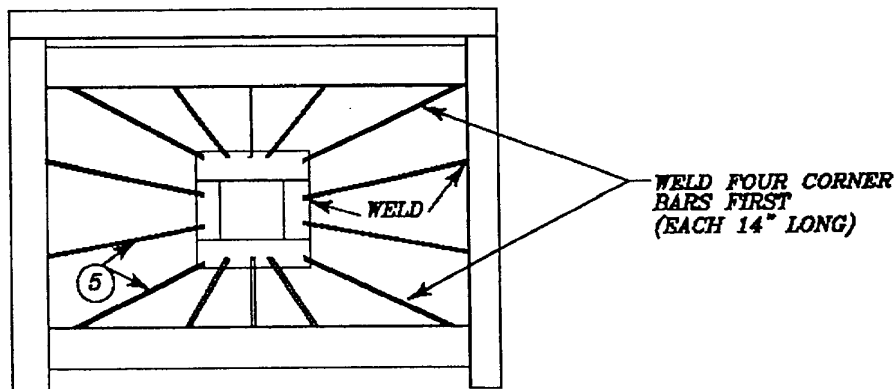
BOTTOM FRAME



BAR SCHEDULE

NO.	SNAPS	SIZE	THICKNESS	LENGTH	QUANTITY
(4)	BAR	1"	1/4"	5"	4

ROD PLACEMENT



ROD SCHEDULE

NO.	SHAPE	SIZE	THICKNESS	LENGTH	QUANTITY
(6)	ROD	1/4" MIN.	-	12" TO 14" (CUT TO FIT)	14

DIB
SYMBOL

FIGURE 4.24c
BMP 4.5.2.1 (CONT.)
DROP INLET INSERT BASKET
DRAWING C

4.5.3 Storm Inlet Sediment Traps

A. Definition

A storm inlet sediment trap is a temporary sediment trap used to collect sediment around a curb inlet or yard drain.

B. Purpose

To prevent sediment and other pollutants from entering conveyance systems.

C. Conditions Where Practice Applies

At the locations where runoff enters conveyance system structures such as curb inlets and drop inlets.

D. Planning Considerations

- | | |
|-----------------|---|
| <i>Timing</i> | The storm inlet sediment trap should be installed before the drainage area is disturbed. |
| <i>Removal</i> | The storm inlet sediment trap should be removed prior to placement of pavement surface at curb inlets. Storm inlet sediment traps used with area inlets and yard drains may be removed once the adjacent disturbed area has been stabilized. |
| <i>Roadways</i> | The storm inlet sediment trap can be used in roadways. Install the trap on the opposite side of the opening and divert water (through a temporary curb opening or other means) from the roadway to the trap to prevent interference with traffic. |

E. Design Criteria and Requirements

1. Install either a yard drain inlet or curb drain inlet sediment trap as specified on plans.
2. The depth of the trap should be at least two (2) feet to minimize resuspension of sediment. The minimum surface area of the sediment trap should be 625 square feet for every acre of drainage area. Side slopes should be 2:1 or flatter.

F. Inspection and Maintenance

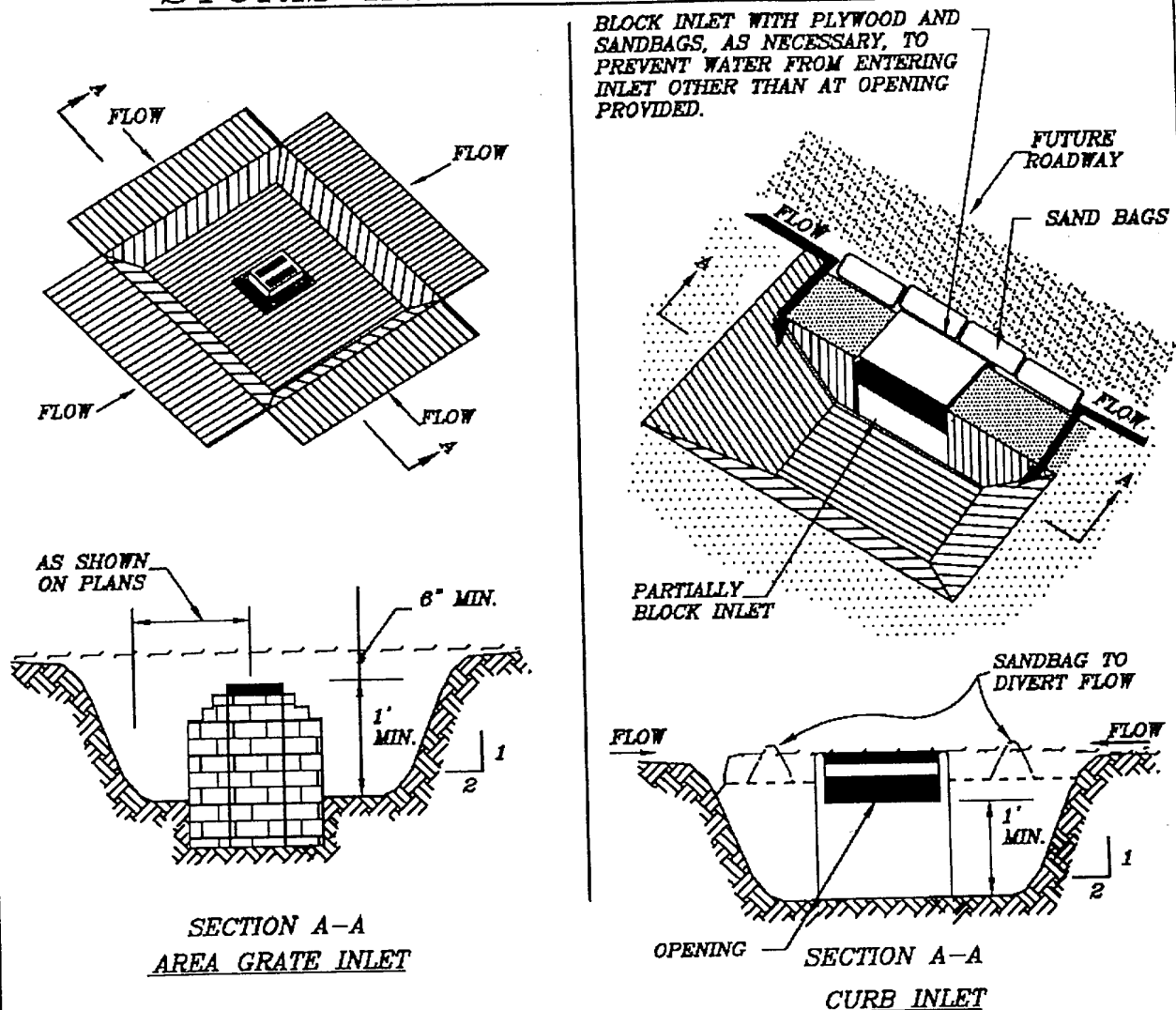
Inspect sediment traps after each rainfall greater than 0.5 inches; daily during periods of prolonged rainfall; and at a minimum of once a week. Repair or replace damaged trap components immediately to restore the requirements of this item.

Remove sediment deposit and restore traps to original dimensions when the sediment has accumulated to one-half the design depth of the trap or one foot, whichever is less.

G. Corresponding Technical Specification (Refer to Appendix C)

Item No. 4531 Storm Inlet Sediment Trap

STORM INLET SEDIMENT TRAPS



GENERAL NOTES:

1. INSTALL EITHER A GRATE INLET OR CURB INLET SEDIMENT TRAP AS SHOWN BY THE CONSTRUCTION DRAWINGS.
2. THE LIMITS OF EXCAVATION SHALL BE AS SHOWN BY THE CONSTRUCTION DRAWINGS.
3. SIDE SLOPE SHALL BE 2:1, OR FLATTER.
4. MAINTAIN A MINIMUM OF 1 FOOT MEASURED VERTICALLY FROM THE BOTTOM OF EXCAVATION FOR INLET OPENING.
5. WHEN THE INLET IS IN A ROADWAY, INSTALL THE TRAP ON THE OPPOSITE SIDE OF THE OPENING AND DIVERT WATER FROM THE ROADWAY TO THE TRAP.



SYMBOL

721-1

FIGURE 4.25
BMP 4.5.3.1
STORM INLET SEDIMENT TRAPS